FERGUS GOLF CLUB
RESIDENTIAL DEVELOPMENT
URBAN TRANSPORTATION CONSIDERATIONS
ZONING BY-LAW AMENDMENT & PLAN OF SUBDIVISION

Township of Centre Wellington, Wellington County

Prepared For: Fergus Development Inc.

UPDATED

July 2026

July 3, 2026

Theyonas Manoharan, P.Eng.
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Markham, ON L3R 1G9

RE: Fergus Golf Club – Proposed Residential Redevelopment, UPDATED Transportation Considerations Report

Dear Theyonas:

Attached please find BA Group's updated Transportation Considerations Report (Traffic Impact Study) for the proposed residential redevelopment at the Fergus Golf Club.

This report provides a comprehensive update to BA Group's November 2025 Urban Transportation Considerations Report and considers that the development proposal now includes 446 single detached residential dwellings and a public road network throughout the Site.

I can confirm that the enclosed report update has been prepared under my supervision and to the best of my knowledge is accurate and true.

Please feel free to let me know if you have any questions.

Sincerely,
BA Consulting Group Ltd.

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Senior Associate

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Background 1
1.2 Existing Site Context 1
1.3 Proposed Development 2
1.4 Study Scope 6

2.0 TRANSPORTATION CONTEXT 7
2.1 Area Road Network 7
2.2 Area Transit Network 7
2.3 Area Cycling Network 7
2.4 Area Pedestrian Context 8

3.0 TRAFFIC VOLUME FORECASTING 13
3.1 Existing Traffic Volumes 13
3.2 Background Traffic Allowances 15
3.2.1 General Corridor Growth 15
3.2.2 Future Background Traffic Volumes 15
3.3 Site Traffic Volumes 20
3.4 Future Total Traffic Volumes 21

4.0 TRAFFIC OPERATIONS ANALYSIS 25
4.1 Traffic Operations Scenarios 25
4.2 Analysis Methodology 25
4.3 Input and Calibration Parameters 25
4.4 Capacity Analysis Results 26

5.0 TRAFFIC CONTROL EVALUATION 28
5.1 Traffic Signal Warrants 28
5.1.1 Traffic Signal Warrants at Wellington Road/ 3 Line 29
5.1.2 Traffic Signal Warrants at Wellington Road/ 2 Line 29
5.1.3 Traffic Signal Warrants at Wellington Road/ Site Access/ Golf Club 30
5.2 All-Way Stop Control Warrant 32

6.0 SIGHT DISTANCE EVALUATION 33
6.1 Wellington Road 19/ Site Access/ Golf Club Driveway 33
6.2 3 Line (Street A and Street G) 33

7.0 EVALUATION FOR LEFT-TURN LANES 35
7.1 Wellington Road 19 & Site Access/ Golf Club Driveway 35
7.2 Wellington Road 19 & 3 Line 35

7.3 Wellington Road 19 & 2 Line 35

8.0 SUMMARY AND CONCLUSIONS 36

LIST OF TABLES

Table 1 Development Proposal 2
Table 2 Existing Traffic Count Information 13
Table 3 Residential Vehicle Trip Generation 20
Table 4 Golf Course Trip Generation 20
Table 5 Site Traffic Distribution 21
Table 6 Unsignalized Intersection Capacity Analysis Results 27
Table 7 Traffic Signal Warrants (2038) – Wellington Road 19 / 3 Line 29
Table 8 Traffic Signal Warrants (2038) – Wellington Road 19 / 2 Line 30
Table 9 Traffic Signal Warrants (2038) – Wellington Road 19 & Site Access/Golf Club 31
Table 10 All-Way Stop Control Warrant Summary – Wellington Road 19 / 3 Line 32
Table 11 Sight Distance (Wellington Road 19 at Site Access/ Golf Club Driveway) 33
Table 12 Sight Distance (3 Line at Street A and Street G) 34

LIST OF FIGURES

Figure 1: Site Location 3
Figure 2: Site Context 4
Figure 3: Proposed Development 5
Figure 4: Area Road Network 9
Figure 5: Existing Lane Configuration and Traffic Control 10
Figure 6: Future Lane Configuration and Traffic Control 11
Figure 7: Existing & Future Area Cycling and Pedestrian Network 12
Figure 8: Existing Traffic Volumes 14
Figure 9: 2033 Corridor Growth Traffic Volumes 16
Figure 10: 2038 Corridor Growth Traffic Volumes 17
Figure 11: 2033 Future Background Traffic Volumes 18
Figure 12: 2038 Future Background Traffic Volumes 19
Figure 13: Site Traffic Volumes 22
Figure 14: 2033 Future Total Traffic Volumes 23
Figure 15: 2038 Future Total Traffic Volumes 24

TABLE OF APPENDICES

Appendix A	Development Concept Plan
Appendix B	Internal Road Network Cross-Section
Appendix C	Traffic Counts
Appendix D	Synchro Worksheets
Appendix E	Traffic Control Warrant Excerpts and Analysis
Appendix F	Sight Distance Assessments
Appendix G	Correspondence with Triton Engineering
Appendix H	Left-Turn Lane Warrant Analysis
Appendix I	Functional Plan for Left-Turn Lanes on Wellington Road 19
Appendix J	Pavement Marking & Signage Plan
Appendix K	On-Street Parking Plan

1.0 INTRODUCTION

BA Group was retained by Fergus Development Inc. to provide transportation consulting services related to a proposed residential redevelopment on a site municipally known as 8243 & 8282 Wellington Road 19, in the Township of Centre Wellington, in the County of Wellington. The existing golf course (the "Site") consists of two parcels; the northwest parcel ("NW Site"), situated on the north side of Wellington Road 19 and the southeast parcel ("SE Site"), situated on the south side of Wellington Road 19. The Site is surrounded by agricultural land to the north and west of the NW Site and south of the SE Site. Third Line is adjacent to the east side of the Site and an existing residential dwelling exists on the west side of the SE Site. The Site location is illustrated in **Figure 1** and the Site context is in **Figure 2.**

This **updated** Transportation Considerations Report has been prepared as part of the **Zoning by-law Amendment and Revision to the Draft Plan of Subdivision** being submitted to the Township of Centre Wellington and the County of Wellington.

1.1 BACKGROUND

This report includes a comprehensive update to BA Group's November 2025 Urban Transportation Considerations Report that has been completed based on the following changes to the development proposal:

- The number of residential units has been increased from 118 single-detached residential dwellings to 446 single-detached residential dwellings; and
- The internal road network has increased in width to reflect public right-of-ways to align with the municipal standards for 18.0 metre and 20.0 metre right-of-ways.

It is noted that all points of access for the Site remain unchanged from the previous submission.

1.2 EXISTING SITE CONTEXT

In 2010, the Fairview and Lake Belwood Golf Clubs were merged to form the Fergus Golf Club. Fairview, which was built in 1977, referred to as the SE Site, is 39.85ha and includes a 9-hole golf course. Lake Belwood (the NW Site) was constructed in 2000, is 42.35ha and includes a total of 18 holes. The total Site area is 82.20ha, and the proposed residential redevelopment will be located on the SE Site, while the communal water and wastewater services are integrated into the existing Golf Course, which will remain, on the NW Site.

1.3 PROPOSED DEVELOPMENT

The proposed development of the Site includes the construction of 446 single detached residential dwellings. The development statistics for the proposed development are summarized in **Table 1**. The Site is expected to be built-out by 2033.

The proposed development is illustrated in **Figure 3** and the development concept plan is provided in **Appendix A.**

The proposed Site circulation includes a public road network inclusive of minor collectors (20-metre right-of-way) and local streets (18-metre right-of-way), with one full-movement access on Wellington Road 19 that aligns to form a 4-legged intersection with the relocated main golf club driveway and two full-movement accesses along 3 Line. Once the golf club driveway on Wellington Road 19 has been shifted to the new location, the existing driveway will remain open for service vehicles only. An additional new driveway for water/ waste water treatment vehicles is also to be provided along the north side of Wellington Road 19. The one site access on Wellington Road 19 and the two accesses on 3 Line, will be unsignalized with stop control on the minor street only. An illustration of the cross-section for the proposed public road is provided in **Appendix B**.

An on-street parking allocation plan has been prepared based on the road network elements proposed for the respective public right-of-way and the location of driveways for the proposed lot fabric. The parking allocation plan is provided in **Appendix K** and illustrates the estimated on-street parking supply.

A Traffic Signage and Pavement Marking Plan is provided in **Appendix J** and aligns with the Ontario Traffic Manual regarding the proposed type and locations of signs and pavement markings within the Site's public road network.

TABLE 1 DEVELOPMENT PROPOSAL

Land Use		Proposed Statistics
	Single Detached Residential Dwellings	**446 units**
	Site Access & Circulation	• 1 full access along Wellington Road 19 and 2 full accesses along 3 Line. • A public road network inclusive of streets with a 20 metre right-of-way (minor collector) and streets with an 18-metre right-of-way (local).

Notes:
1. Site statistics based on site plans prepared by GSP Group dated May 11, 2026.

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FIGURE 1 SITE LOCATION

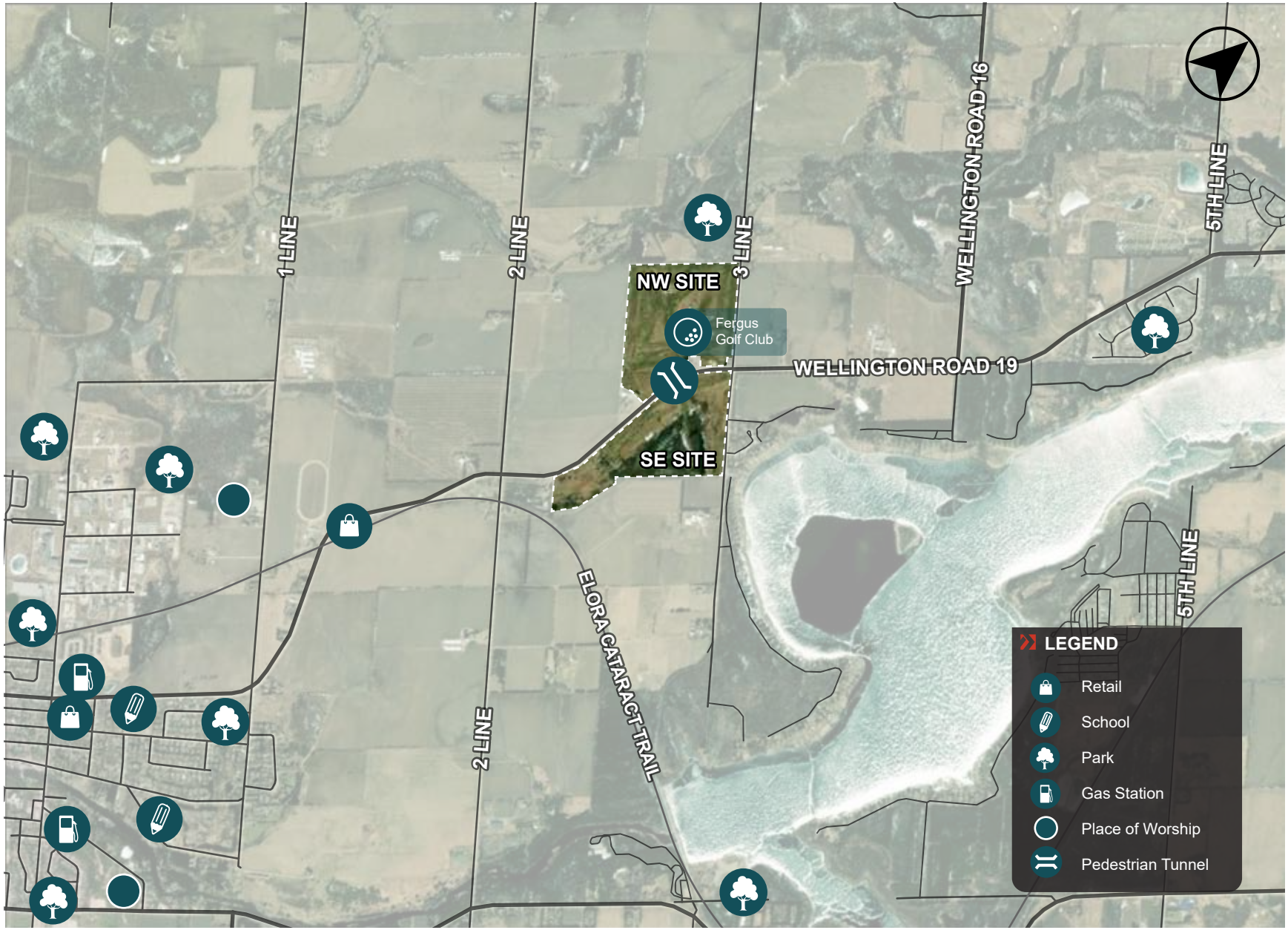

FIGURE 2 SITE CONTEXT

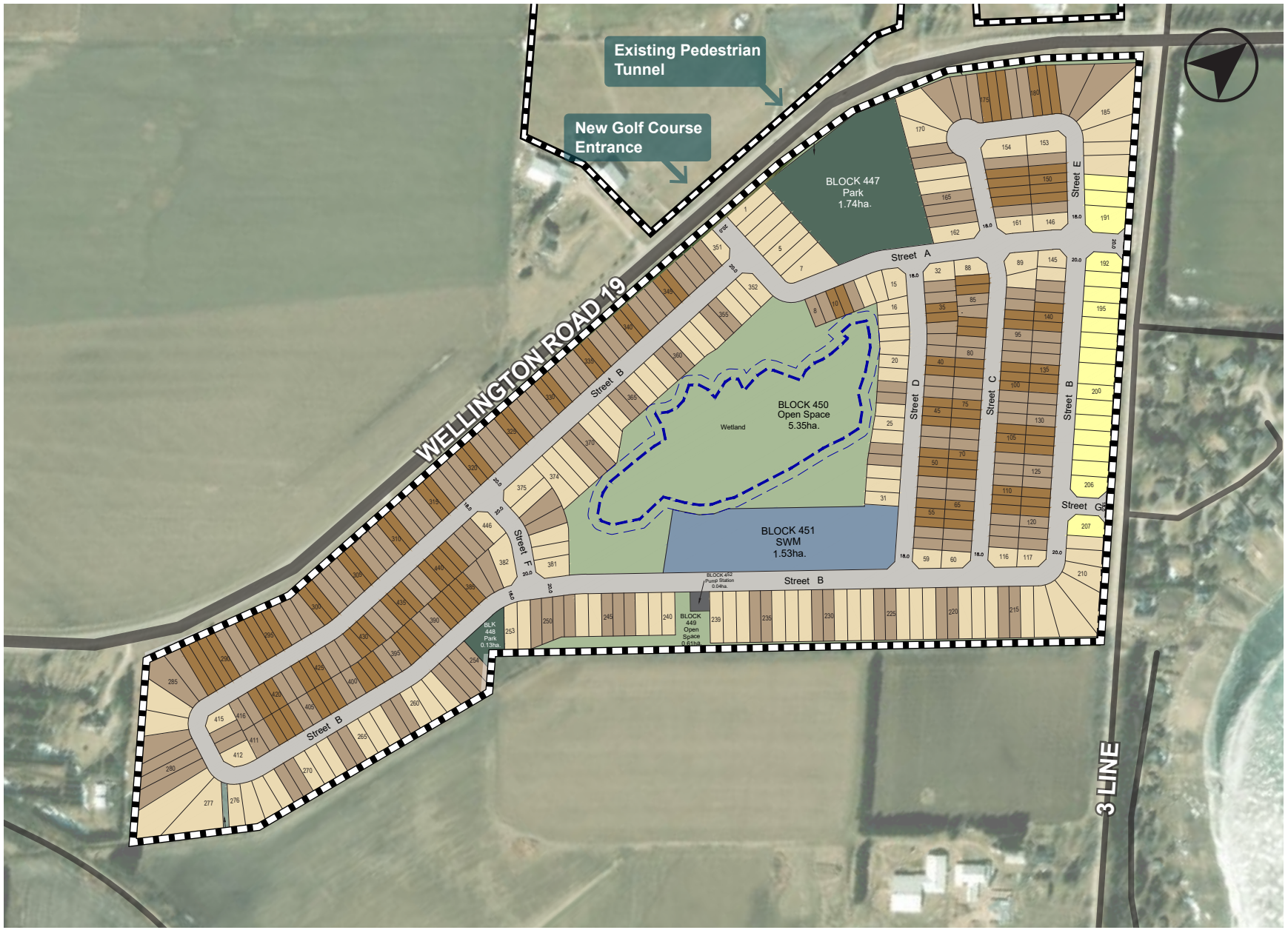

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FIGURE 3 PROPOSED DEVELOPMENT

1.4 STUDY SCOPE

Development Concept Plan

- A summary of the proposed development concept plan.
- An overview of the Site and the area-wide transportation system.
- A review of the transportation elements of the proposed development plan that includes access and circulation.

Transportation Context

- A description of the existing transportation context with consideration for the area road network and active transportation facilities.
- A description of future transportation changes and/or improvements to the area context such as planned road upgrades and active transportation improvements.

Site Plan

- A review of the functionality and appropriateness of the proposed new public road network.

Traffic Operations Review

- An assessment of the existing traffic patterns and traffic volumes in the study area during the key weekday morning and afternoon peak hours.
- A comprehensive review of traffic-related changes that may occur in the area with consideration for corridor growth and construction of other area development projects.
- A review of traffic operations at intersections in the area under existing and future conditions including an assessment of the operational impacts of the proposed development.
- An assessment of the need for traffic signals/ all-way stop control on Wellington Road 19 as a result of Site traffic.

Site Access Review

- A review of the proposed access at Wellington Road 19 and the proposed accesses at 3 Line.
- Confirmation of the proposed traffic control at the Site access points.
- Evaluation of the sight distance at the proposed access points.
- Evaluation of the need for left-turn lanes at the Site access point on Wellington Road 19.

The findings of this review are summarized in the following sections.

2.0 TRANSPORTATION CONTEXT

2.1 AREA ROAD NETWORK

The existing area network of arterial roads, collector roads and local roads are described below and illustrated in **Figure 4.** The existing and future lane configuration and traffic control are shown in **Figure 5** and **Figure 6,** respectively**.**

Wellington Road 19 is a northeast/southwest Wellington County arterial road that extends from Highway 6 in Fergus to the border between Wellington County and Dufferin County. In the vicinity of the Site, Wellington Road 19 has a rural 2-lane cross section with paved shoulders and a defacto speed limit of 80 km/h.

3 Line is a northwest/southeast Township of Centre Wellington local road that extends from Lake Belwood in the southeast to Wellington County Road 109 in the northwest. 3 Line is paved southeast of Wellington County Road 19 (adjacent to the proposed development) and the speed limit is not posted.

2 Line is a Township of Centre Wellington local road that extends from to the Eramosa Garafraxa Townline to Wellington Road 109. 2 Line is paved and the speed limit is not posted.

2.2 AREA TRANSIT NETWORK

The Township of Centre Wellington does not currently operate a local public transit system and there are no plans to establish transit service in the vicinity of the Site. The closest public transit systems to the Site are in Guelph (30km away), Elmira (30km away) and Orangeville (35km away). Guelph and Elmira (through bus travel to Waterloo) have multiple GO Transit connections and a VIA Rail station in Kitchener.

2.3 AREA CYCLING NETWORK

Active Transportation Plan (2012)

In 2012, Wellington County, in association with the seven local area municipalities and Wellington-Dufferin-Guelph (WDG) completed an Active Transportation Plan. The plan is a long-term strategy to create a pedestrian and cycling supportive environment that will encourage both utilitarian and recreational travel by walking and cycling, while promoting the importance of active lifestyles for residents and tourists.

Existing cycling facilities near the Site are described below. The Active Transportation Plan includes recommendations for a variety of improvements throughout the County. On Wellington Road 19, there are future plans to extend the paved shoulders east of 3 Line.

Wellington Road 19

In the vicinity of the Site, Wellington Road 19 includes paved shoulders for cyclists.

Elora Cataract Trail
Just south of Wellington Route 19 there is an off-road “spine route” know as the Elora Cataract Trail, a 47km long trail between Elora and Forks of Credit Provincial Park. The trail is located along the southern edge of the SE Site, and crosses 2 Line, 150m southeast of Wellington Road 19.

The existing area cycling facilities are displayed in **Figure 7**.

2.4 AREA PEDESTRIAN CONTEXT

There is an existing pedestrian tunnel under Wellington Road 19 which provides connectivity between the Site and the Fergus Golf Club (SE Site and NW Site).

In order to enhance the level of safety for pedestrians, the proposed public road network for the Site includes sidewalks on one side of the road.

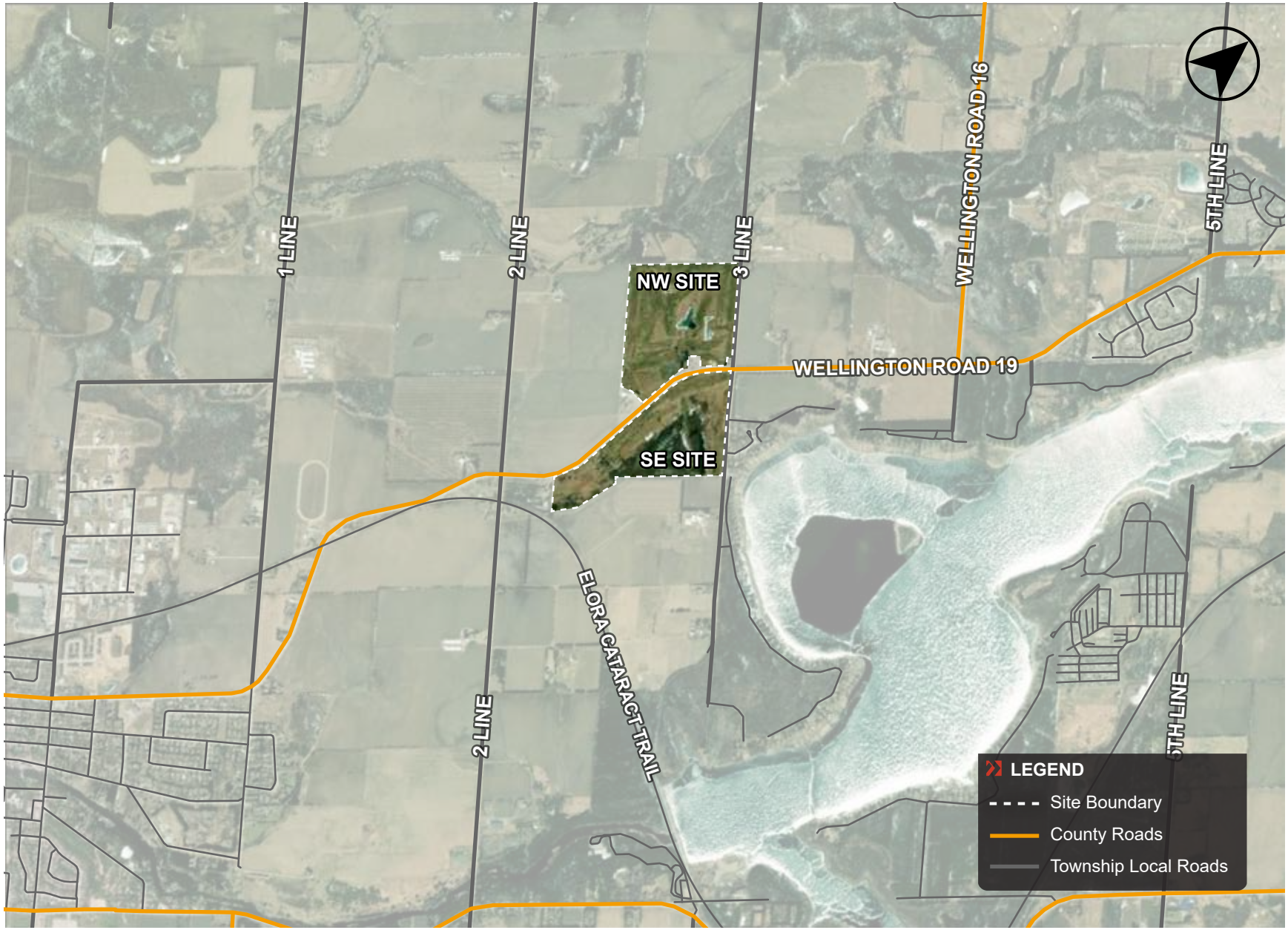

FIGURE 4 AREA ROAD NETWORK

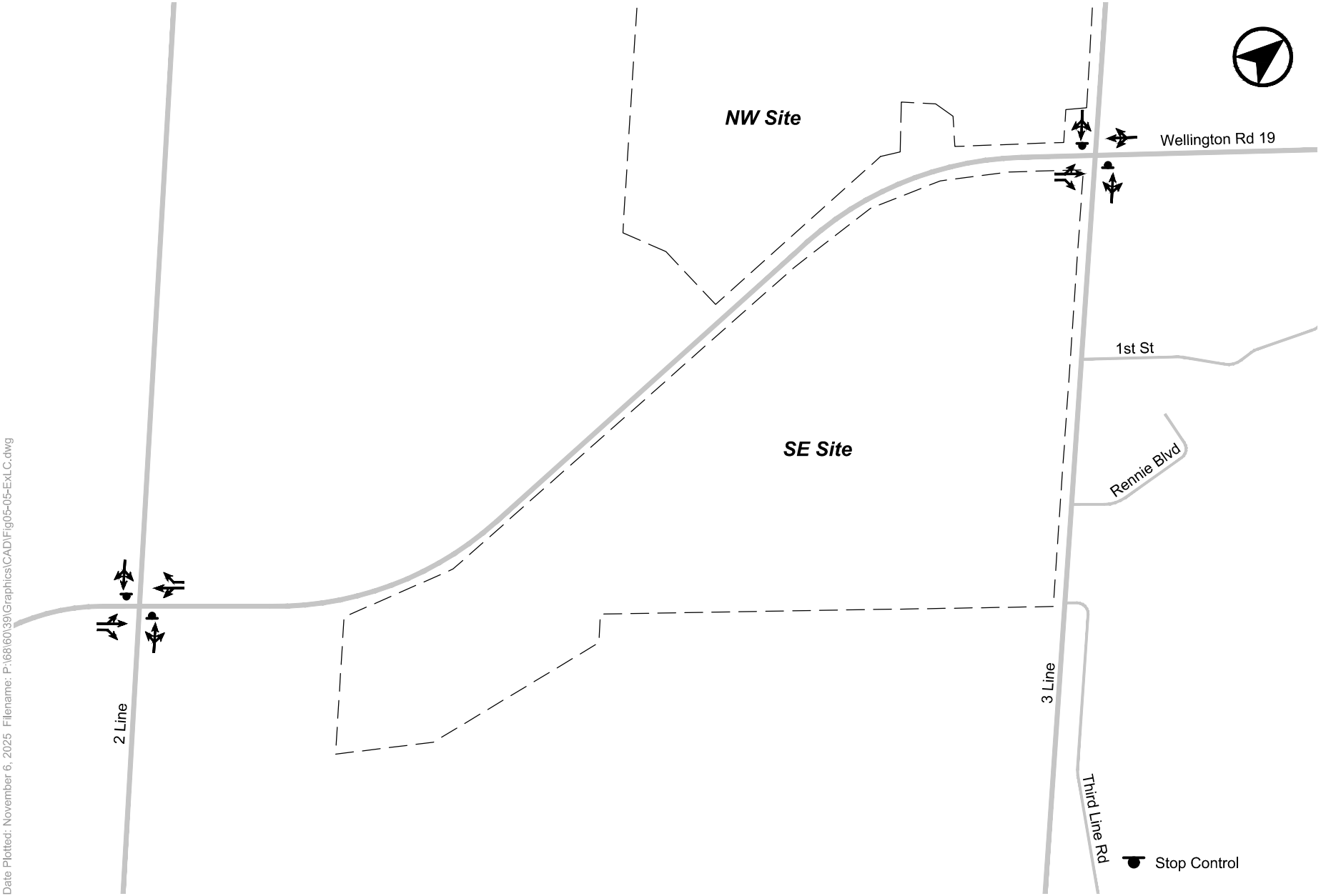

FIGURE 5 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

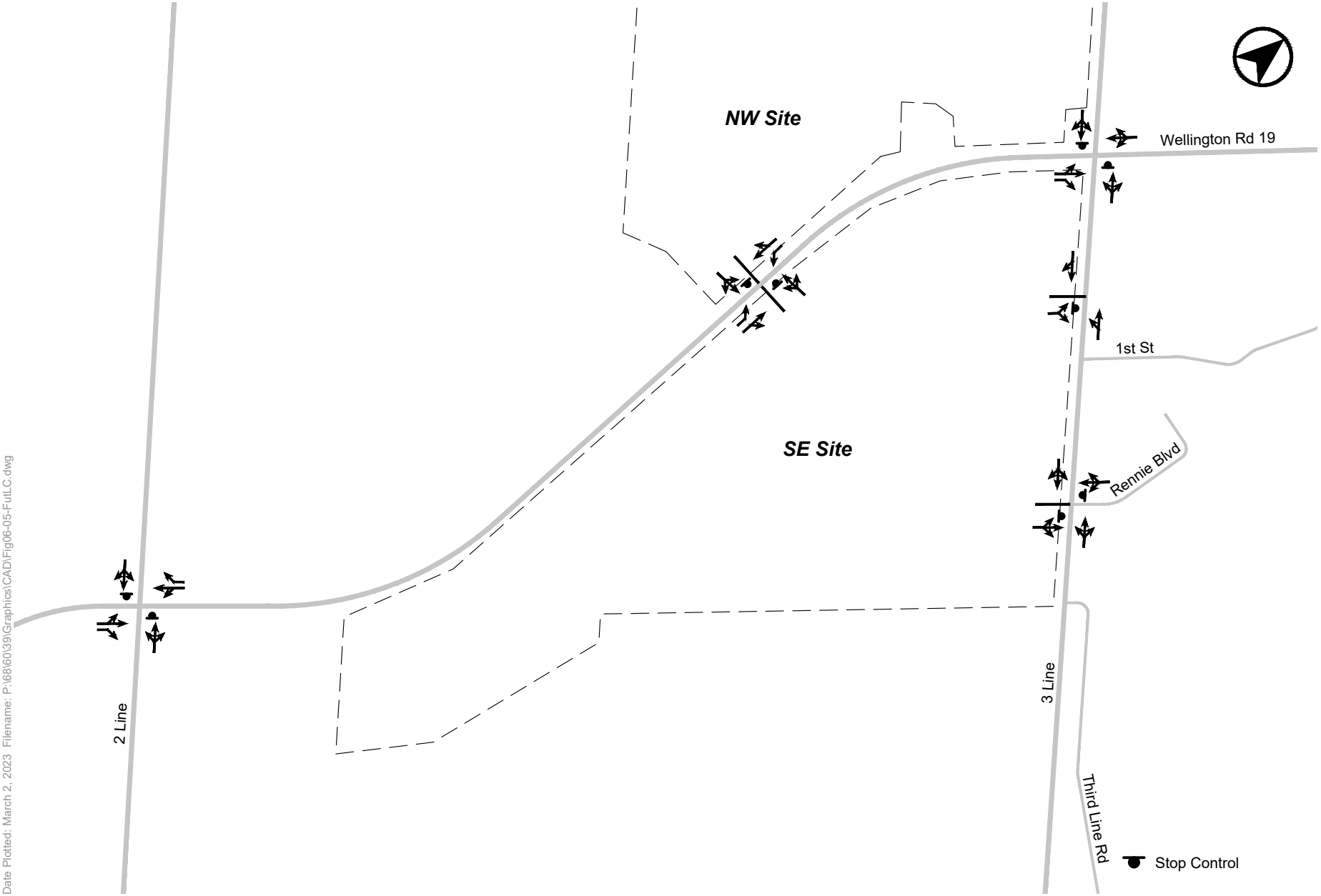

FIGURE 6 FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL

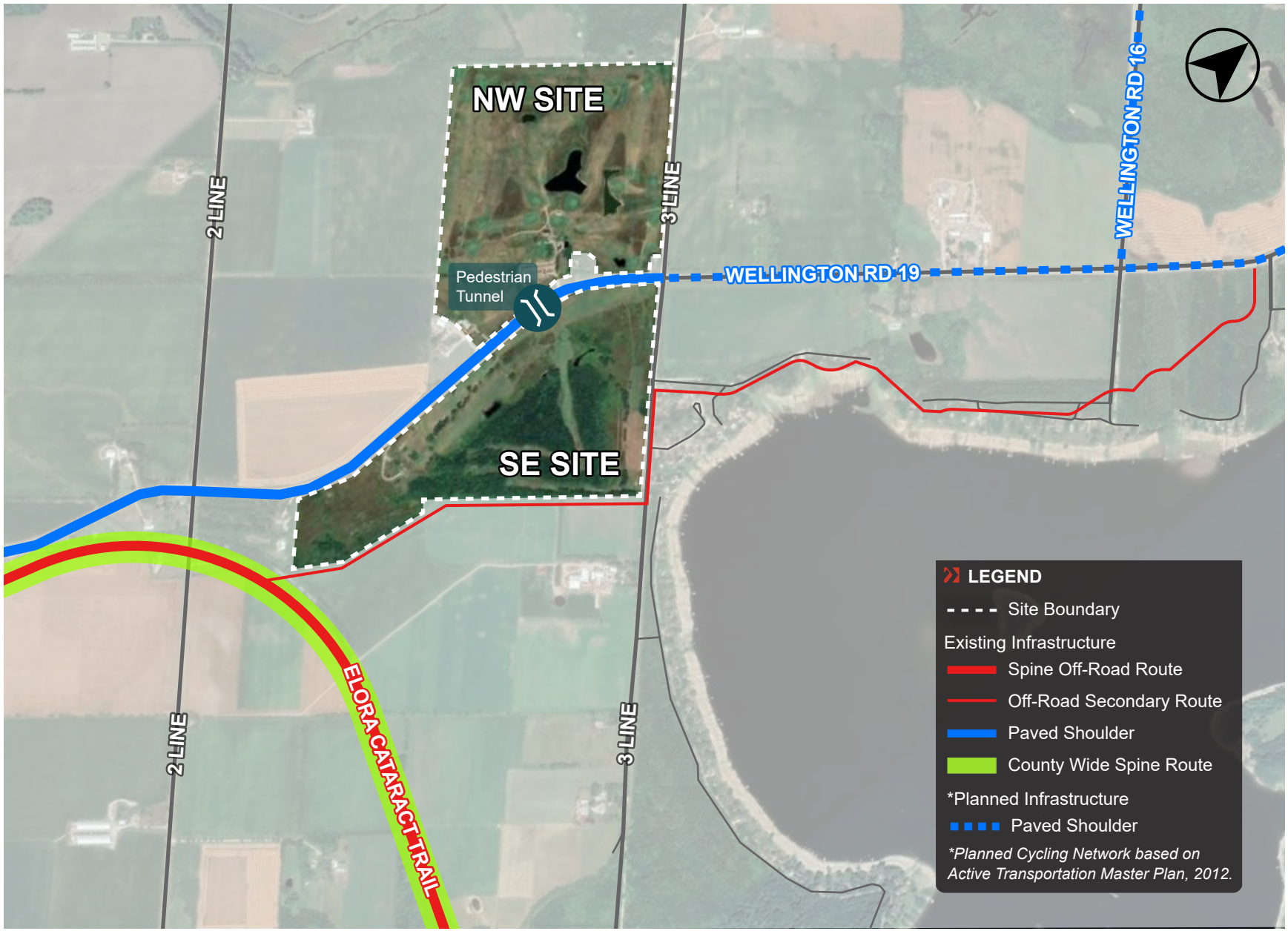

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FIGURE 7 EXISTING & FUTURE AREA CYCLING AND PEDESTRIAN NETWORK

3.0 TRAFFIC VOLUME FORECASTING

3.1 EXISTING TRAFFIC VOLUMES

Baseline existing turning movement volumes were established for the intersection of **Wellington Road 19 / 3 Line** and **Wellington Road 19 / 2 Line**, based on the most recently available traffic count data, collected by Spectrum Traffic Inc. on behalf of BA Group. The traffic data was collected in July of 2022, on two consecutive Saturdays and on a weekday, so that the traffic analysis was based on data collected during the peak summer months of the year. It is noted that the traffic data was collected on Saturday, July 2nd of the holiday weekend, but in order to be conservative, as the traffic volumes were higher on the following Saturday, July 9th, the traffic analysis was based on the higher Saturday traffic volumes.

The July 2022 traffic count information is summarized in **Table 2**. Detailed traffic count data is provided in **Appendix C**.

TABLE 2 EXISTING TRAFFIC COUNT INFORMATION

Intersection	Date of Count	Source
Wellington Road 19 / 2 Line	Saturday, July 2, 2022[1] Saturday, July 9th, 2022 and Tuesday, July 12th, 2022	Spectrum Traffic Inc.
Wellington Road 19 / 3 Line		

Note:
1. The Saturday, July 2 traffic counts were not used in the traffic analysis as the Saturday, July 9th traffic counts were higher.

Based on growth assumptions outlined in detail in **Section 3.2.1**, a compounding growth rate of 2% was applied for four years to establish 2026 traffic volumes. These volumes were adopted to represent existing traffic conditions. Existing traffic volumes were rounded to the nearest 5 vehicles.

Existing traffic volumes for the weekday morning, weekday afternoon and Saturday peak hours adopted for the analysis are illustrated in **Figure 8**.

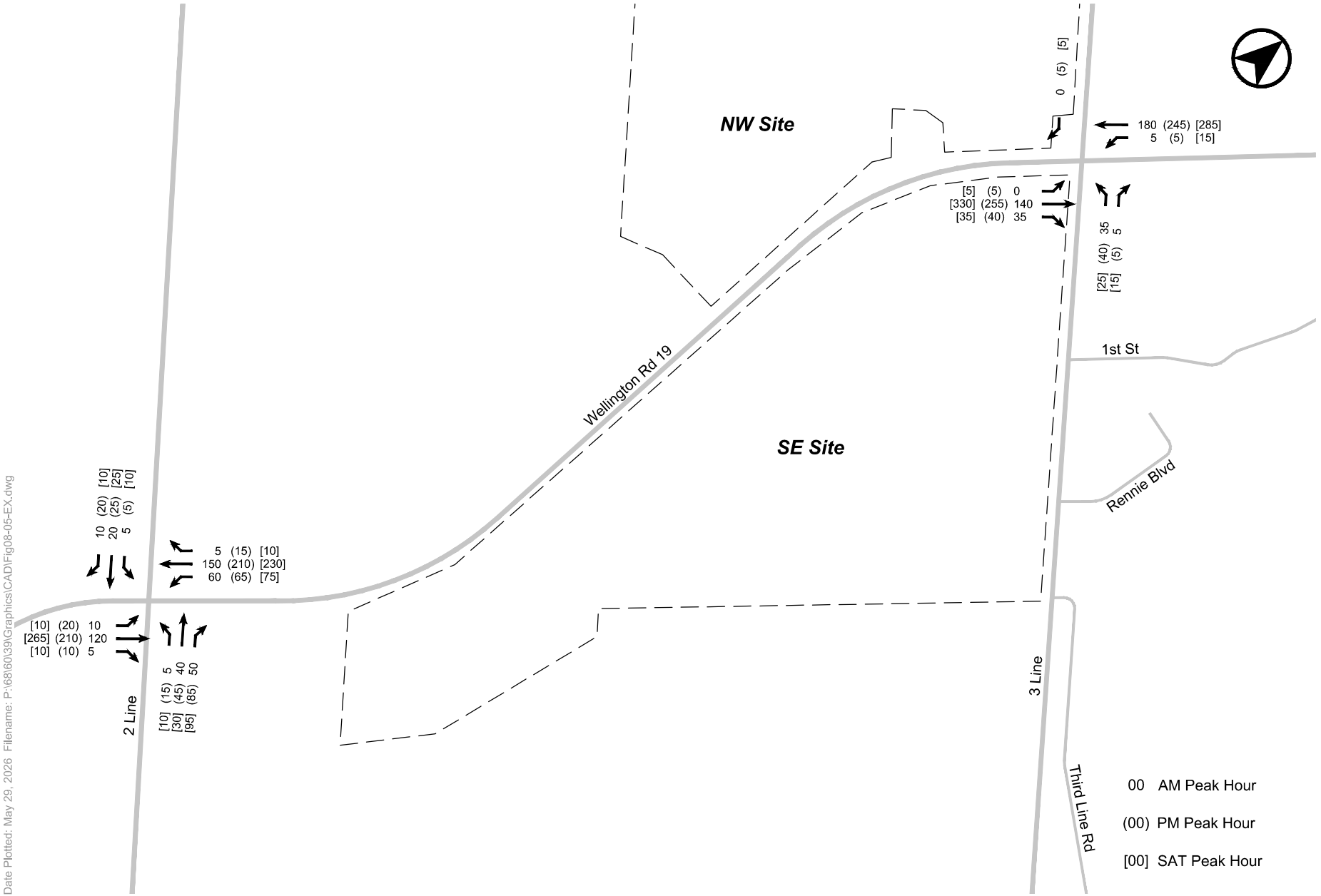

FIGURE 8 EXISTING TRAFFIC VOLUMES

3.2 BACKGROUND TRAFFIC ALLOWANCES

Forecasted background traffic volumes for the 2033 and 2038 horizon years account for changes to traffic conditions in the road network over time, and represent the summation of existing traffic volumes and growth along the Wellington Road 19 corridor. Traffic allowances for specific background developments were not included in the analysis, as there are no planned developments in the immediate vicinity of the Site.

3.2.1 General Corridor Growth

In order to conservatively capture development progress outside of the Site vicinity and study area for both horizon years of 2033 (Site build-out) and 2038 (five-years beyond build-out), a growth rate of 2% per year was applied during the weekday morning, weekday afternoon and Saturday peak hours.

General corridor growth allowances for both the 2033 and 2038 horizon years are illustrated in **Figure 9** and **Figure 10,** respectively.

3.2.2 Future Background Traffic Volumes

Future background traffic volumes in the 2033 and 2038 horizon years, representing the summation of the existing traffic volumes plus general corridor growth allowances, are illustrated in **Figure 11** and **Figure 12**, respectively.

FIGURE 9 2033 CORRIDOR GROWTH TRAFFIC VOLUMES

FIGURE 10 2038 CORRIDOR GROWTH TRAFFIC VOLUMES

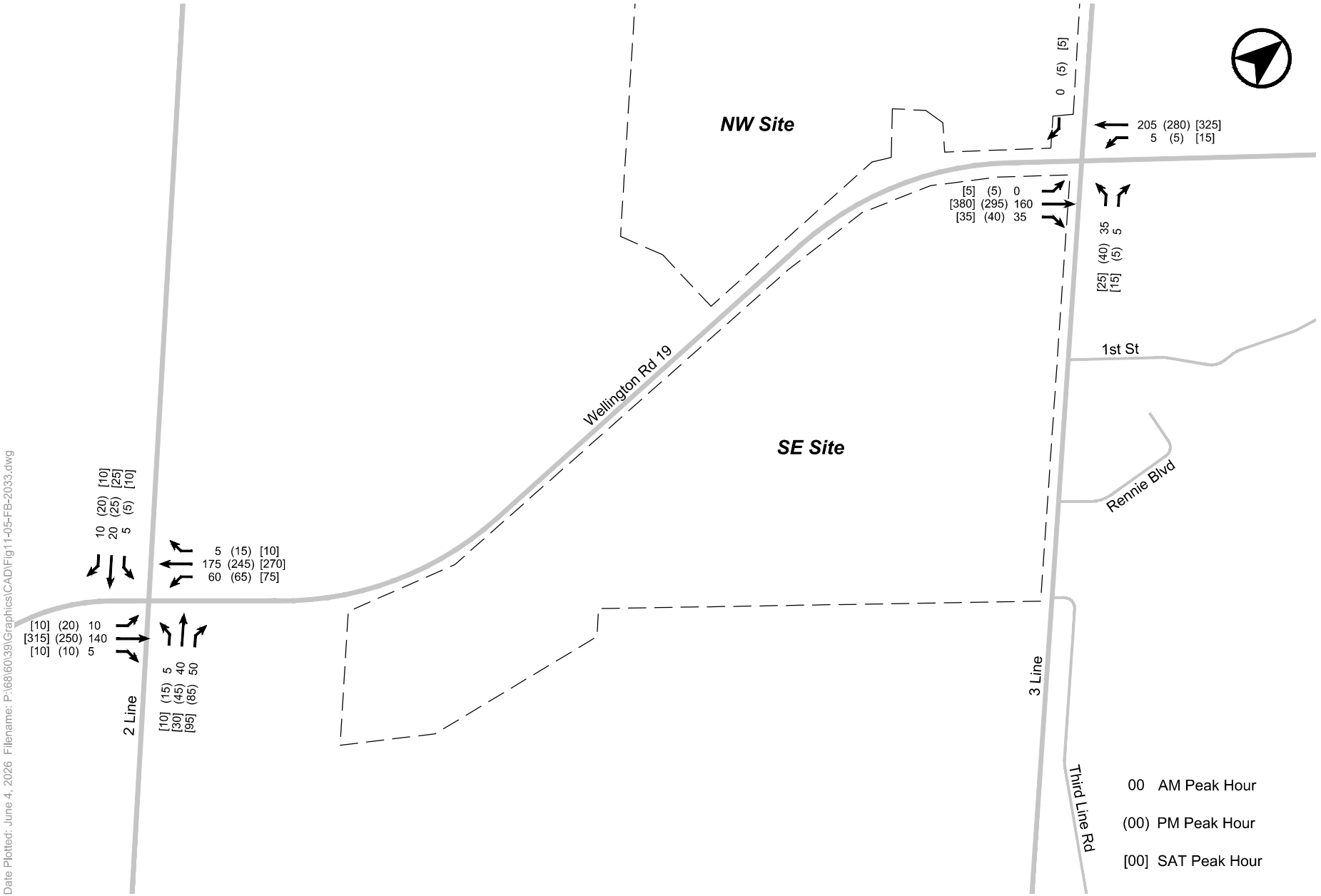

FIGURE 11 2033 FUTURE BACKGROUND TRAFFIC VOLUMES

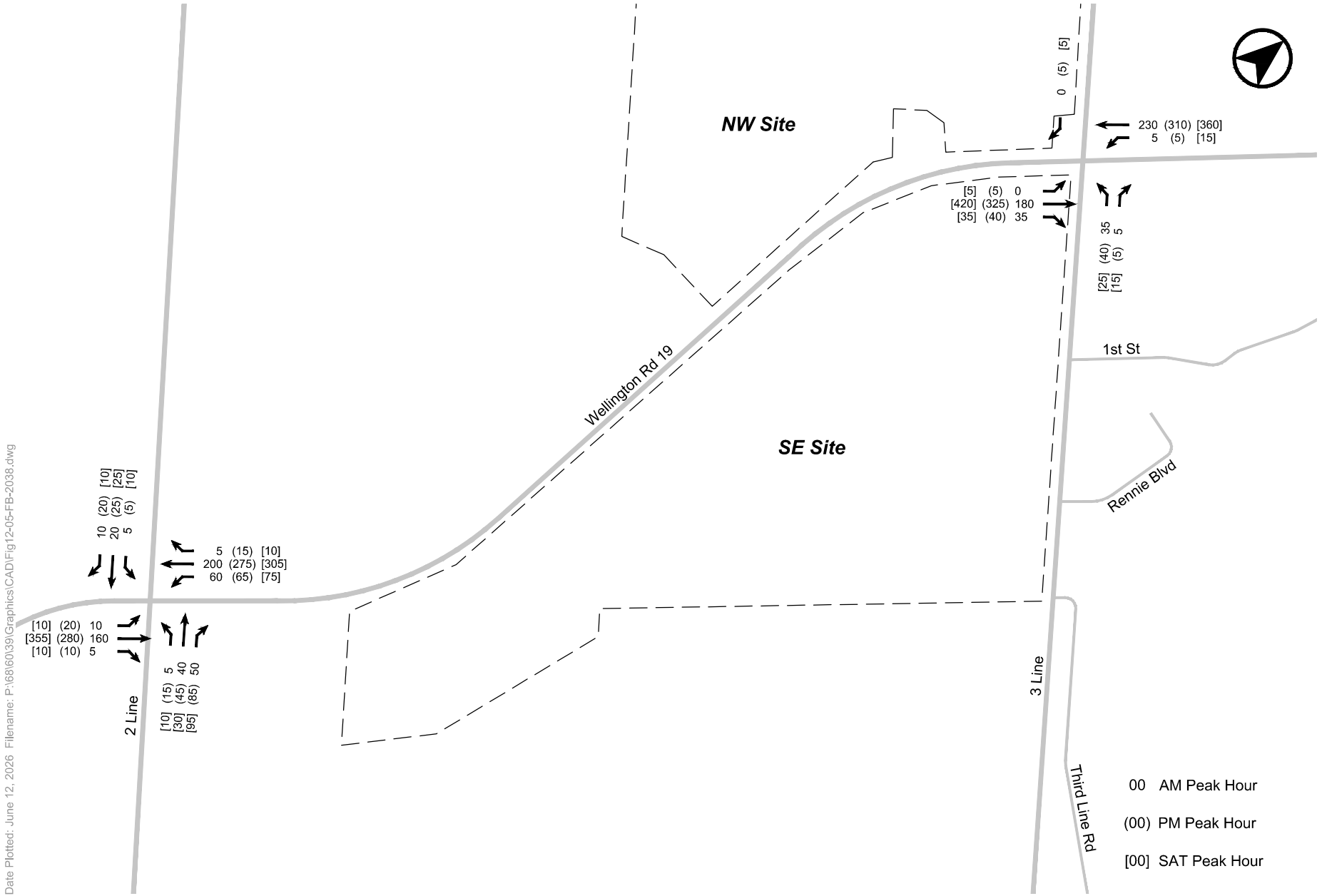

FIGURE 12 2038 FUTURE BACKGROUND TRAFFIC VOLUMES

3.3 SITE TRAFFIC VOLUMES

Residential Trip Generation

The residential trip generation potential of the proposed SE Site is based upon trip behaviour observed within the ITE Trip Generation Manual (10th Edition), Land Use Code (LUC) 210 (Single-Family Detached Housing). The trip rates and resultant trips are summarized in **Table 3**.

The Site is anticipated to generate in the order of 335, 445 and 410 two-way residential vehicle trips during the weekday morning, weekday afternoon and Saturday peak hours, respectively.

TABLE 3 RESIDENTIAL VEHICLE TRIP GENERATION

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	2-Way	In	Out	2-Way	In	Out	2-Way
Directional Distribution	25%	75%	100%	63%	37%	100%	54%	46%	100%
Residential Trip Rate (trips/unit)	0.19	0.56	0.74	0.62	0.37	0.99	0.50	0.42	0.92
Residential Vehicle Site Trips (446 units)	**85**	**250**	**335**	**280**	**165**	**445**	**220**	**190**	**410**

Notes:
1. Site trips are rounded to the nearest 5 vehicles.

Golf Course Trip Generation

The trip generation potential of the golf course on the NW Site is based upon trip behaviour observed within the ITE Trip Generation Manual (11th Edition), Land Use Code (LUC) 430 (Golf Course). The trip rates and resultant trips are summarized in **Table 3**.

The traffic volumes generated by the golf club are expected to be in the order of 35 two-way vehicle trips during the weekday morning peak hour and 55 two-way vehicle trips during the weekday afternoon and Saturday peak hours.

TABLE 4 GOLF COURSE TRIP GENERATION

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	2-Way	In	Out	2-Way	In	Out	2-Way
Directional Distribution	79%	21%	100%	53%	47%	100%	49%	51%	100%
Trip Rate (trips/hole)	1.39	0.37	1.76	1.54	1.37	2.91	1.43	1.48	3.03
Golf Course Site Trips (18 holes)	**25**	**10**	**35**	**30**	**25**	**55**	**25**	**30**	**55**

Notes:
1. Site trips are rounded to the nearest 5 vehicles.

Since detailed existing traffic volumes associated with the golf course on the northwest Site were not available, a conservative approach was adopted, wherein the trips summarized in **Table 4** were added to the network to account for the new golf course entrance and no traffic volumes were removed.

Trip Distribution

The new trips for the Site in the weekday morning and afternoon peak hours were assigned to the study area road network based on the observed travel patterns at the intersection of **Wellington Road 19 / 3 Line** and at the intersection of **Wellington Road 19 / 2 Line**.

The Site traffic distribution is summarized in **Table 5**. Site traffic volumes on the area road network are illustrated in **Figure 13**.

TABLE 5 SITE TRAFFIC DISTRIBUTION

To / From Site	Corridor	Inbound			Outbound		
		AM	PM	Sat	AM	PM	Sat
North	3 Line	0%	0%	0%	0%	0%	0%
South	3 Line	10%	10%	5%	10%	10%	10%
North	2 Line	5%	5%	5%	10%	5%	5%
South	2 Line	15%	20%	15%	20%	20%	15%
East	Wellington Road 19	45%	40%	40%	35%	40%	45%
West	Wellington Road 19	25%	25%	35%	25%	25%	25%
Total		**100%**			**100%**		

3.4 FUTURE TOTAL TRAFFIC VOLUMES

Future total traffic volumes in the 2033 and 2038 horizon years reflect the sum of future background traffic volumes in the respective horizons with total SE and NW Site traffic volumes, and are summarized in **Figure 14** and **Figure 15**, respectively.

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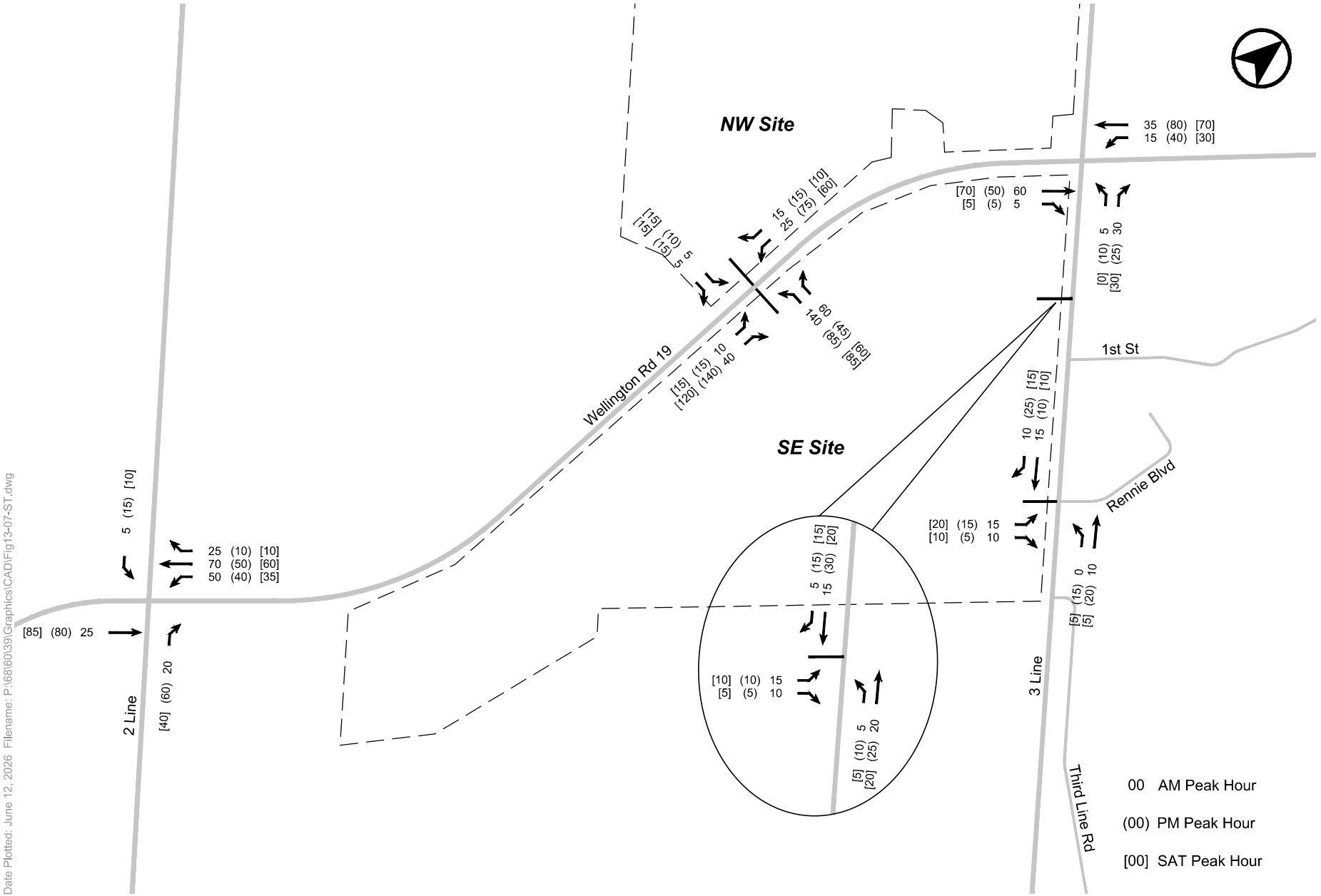

FIGURE 13 SITE TRAFFIC VOLUMES

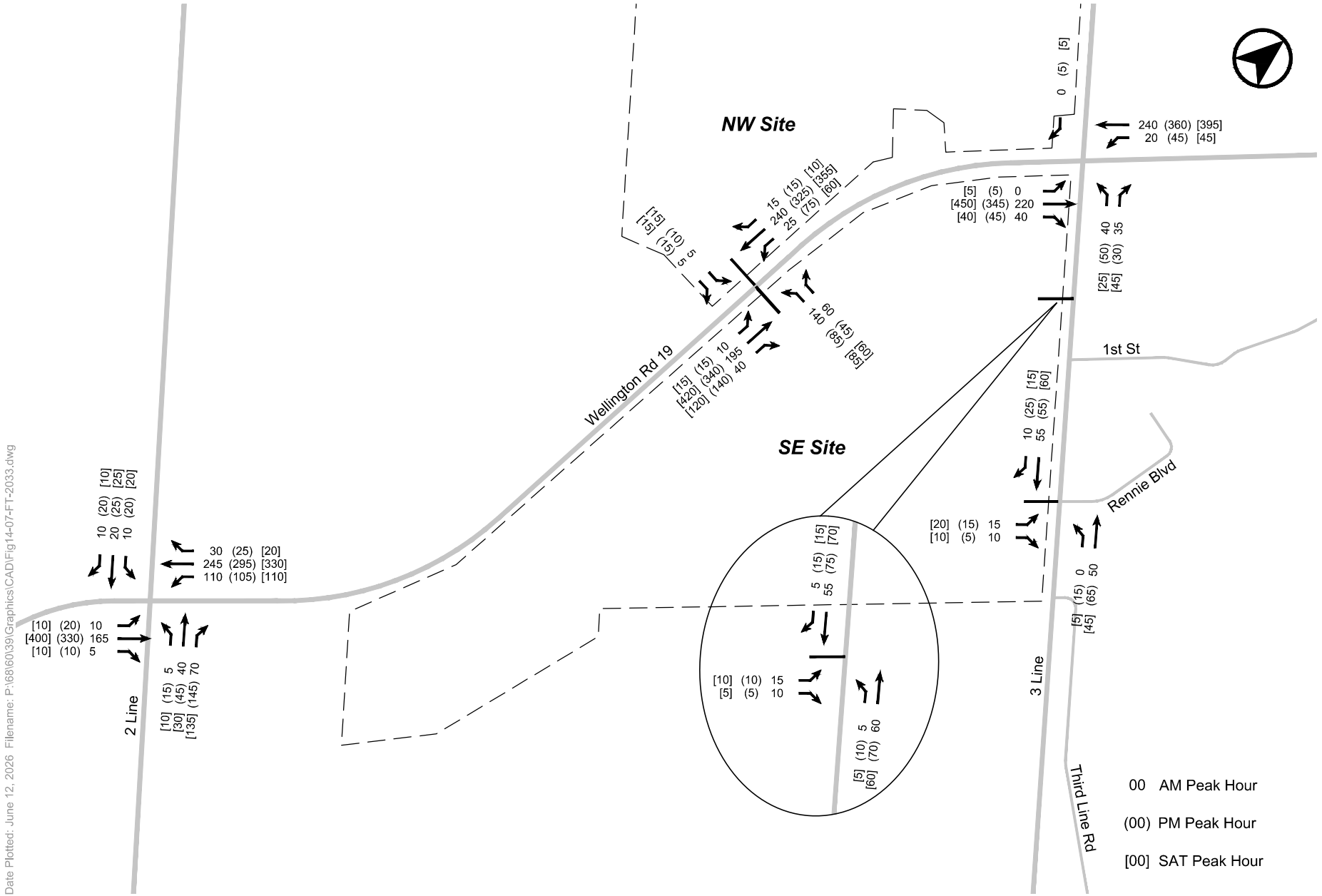

FIGURE 14 2033 FUTURE TOTAL TRAFFIC VOLUMES

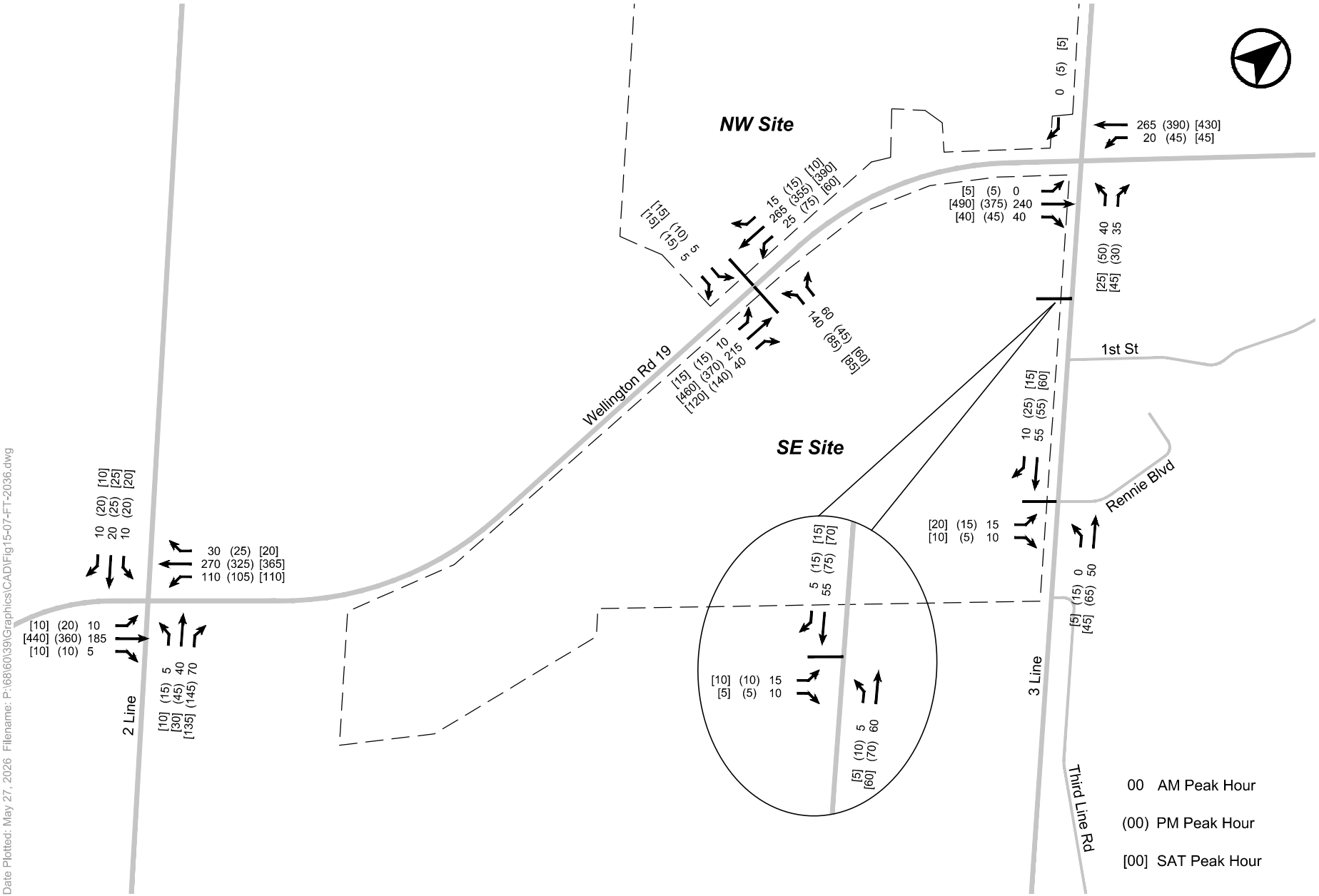

FIGURE 15 2038 FUTURE TOTAL TRAFFIC VOLUMES

4.0 TRAFFIC OPERATIONS ANALYSIS

4.1 TRAFFIC OPERATIONS SCENARIOS

A traffic operations analysis was completed for the following scenarios:

- Existing traffic conditions;
- Future background traffic conditions (2033 horizon year);
- Future total traffic conditions (2033 horizon year with full build-out of Site);
- Future background traffic conditions (2038 horizon year at 5 years post build-out); and
- Future total traffic conditions (2038 horizon year at 5 years post build-out of Site).

4.2 ANALYSIS METHODOLOGY

The intersection capacity analysis was completed using Synchro Version 11 and the Highway Capacity Manual (HCM 2000) methodology. For unsignalized intersections, including all intersections in the study area, level of service (LOS) characterizes operational conditions for key movements in terms of delay within the traffic stream[1]. LOS A represents a good level of service with short delays. LOS E and F represent longer delays.

4.3 INPUT AND CALIBRATION PARAMETERS

Key parameters adopted in the analysis include:

Lane Configurations
Lane configurations are based on existing configurations at the intersection of **Wellington Road 19 / 3 Line** and **Wellington Road 19 / 2 Line**. For all Site access driveways, there is assumed to be one lane in each direction of travel.

Heavy Vehicle Percentages
Heavy vehicle percentages were derived from existing turning movement counts. Where the intersection is not existing, as is the case with the Site accesses, the Synchro default of 2% is assumed for all movements.

Pedestrian and Cycling Volumes
Volumes of pedestrians and cyclists were derived from existing turning movement counts. Synchro defaults have been adopted for all other parameters.

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[1] HCM Level of Service criteria for unsignalized intersections:
- LOS A: Control Delay ≤ 10s
- LOS B: 10s < Control Delay ≤ 15s
- LOS C: 15s < Control Delay ≤ 25s
- LOS D: 25s < Control Delay ≤ 35s
- LOS E: 35s < Control Delay ≤ 50s
- LOS F: Control Delay > 50s

4.4 CAPACITY ANALYSIS RESULTS

Intersections within the study area, including existing and planned for the future, operate acceptably under future conditions. No capacity-related mitigation measures are recommended for any of the Site intersections, with the exception of left-turn lanes on Wellington Road 19 at the Site access/ golf club driveway (discussed further in **Section 7.0**), as traffic volumes remain relatively low under future total conditions in 2033 and 2038.

All movements at unsignalized intersections in the study area are expected to operate acceptably at LOS D or better, with the exception of the southbound approach at Wellington Road 19 / 2 Line. Delays for this approach may exceed 30 and 50 seconds, during the weekday afternoon and Saturday peak hours, respectively, depending on how much growth along Wellington Road 19 is realized. The delay for southbound vehicles on 2 Line in reasonable however, in consideration that these vehicles are entering an arterial road with higher volumes. It is noted however that the traffic analysis is considered to be conservative, hence the intersection of Wellington Road 19 at 2 Line should continue to be monitored in the future. It is also noted that if traffic signals are installed in the future at Wellington 19/ 2 Line (as discussed in **Section 5.1.2**), the delays that result in an LOS F for the southbound approach would likely be reduced.

All movements at the proposed Site accesses are expected to operate acceptably at LOS C or better, with the exception of the northbound approach at Wellington Road 19 / Site Access, where delays may exceed 30 seconds during the weekday afternoon and Saturday peak hours, depending on how much growth along Wellington Road 19 is realized. This delay exiting the Site is however reasonable, in consideration that a low volume of vehicles are entering Wellington 19, a higher volume arterial road.

Table 6 summarizes the capacity analysis results for intersections in the study area. Synchro reports are provided in **Appendix D**.

TABLE 6 UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS

Key Movements	Existing		2033 Horizon Year				2038 Horizon Year			
			Future Background		Future Total		Future Background		Future Total	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Wellington Road 19 / 2 Line										
EBTL	A (A) [A]	0.6 (0.8) [0.4]	A (A) [A]	0.6 (0.7) [0.3]	A (A) [A]	0.5 (0.6) [0.3]	A (A) [A]	0.5 (0.7) [0.3]	A (A) [A]	0.5 (0.6) [0.3]
EBR	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]
WBTL	A (A) [A]	2.4 (2.2) [2.5]	A (A) [A]	2.2 (2.1) [2.3]	A (A) [A]	3.0 (2.9) [3.0]	A (A) [A]	2.1 (2.0) [2.2]	A (A) [A]	2.9 (2.9) [3.0]
WBR	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]
NBTLR	B (B) [B]	11.6 (14.8) [14.4]	B (C) [C]	12.1 (16.3) [15.9]	B (C) [C]	14.2 (23.4) [21.9]	B (C) [C]	12.5 (17.6) [17.5]	B (D) [D]	14.9 (26.5) [25.2]
SBTLR	B (B) [C]	12.2 (14.3) [17.9]	B (C) [C]	12.7 (15.5) [20.3]	C (D) [E]	17.1 (33.0) [41.9]	B (C) [C]	13.3 (16.6) [22.8]	C (E) [F]	18.2 (38.4) [51.5]
Wellington Road 19 / 3 Line										
EBTL	A (A) [A]	0.0 (0.2) [0.1]	A (A) [A]	0.0 (0.2) [0.1]	A (A) [A]	0.0 (0.2) [0.1]	A (A) [A]	0.0 (0.2) [0.1]	A (A) [A]	0.0 (0.1) [0.1]
EBR	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]	A (A) [A]	0.0 (0.0) [0.0]
WBTLR	A (A) [A]	0.2 (0.2) [0.5]	A (A) [A]	0.2 (0.2) [0.5]	A (A) [A]	0.8 (1.3) [1.4]	A (A) [A]	0.2 (0.2) [0.5]	A (A) [A]	0.7 (1.3) [1.4]
NBTLR	B (B) [B]	11.2 (14.0) [14.6]	B (C) [C]	11.7 (15.3) [16.2]	B (C) [C]	12.5 (19.5) [18.2]	B (C) [C]	12.3 (16.5) [17.7]	B (C) [C]	13.0 (21.4) [20.1]
SBTLR	A (A) [A]	0.0 (9.7) [10.0]	A (A) [B]	0.0 (9.9) [10.3]	A (B) [B]	0.0 (10.5) [10.8]	A (B) [B]	0.0 (10.1) [10.5]	A (B) [B]	0.0 (10.8) [11.1]
Wellington Road 19 / Site Access										
EBL	Intersection does not exist.				A (A) [A]	7.8 (8.1) [8.1]	Intersection does not exist.		A (A) [A]	7.9 (8.2) [8.2]
EBTLR					A (A) [A]	0.2 (0.2) [0.2]			A (A) [A]	0.2 (0.2) [0.3]
WBL					A (A) [A]	7.8 (8.7) [8.9]			A (A) [A]	7.9 (8.9) [9.1]
WBTLR					A (A) [A]	0.4 (1.4) [1.2]			A (A) [A]	0.4 (1.4) [1.2]
NBTLR					C (D) [E]	18.2 (34.3) [41.8]			C (E) [F]	19.9 (40.8) [54.0]
SBTLR					B (C) [C]	12.5 (16.5) [20.7]			B (C) [C]	13.0 (17.6) [23.0]
North Site Access / 3 Line										
EBLR	Intersection does not exist.				A (A) [A]	9.1 (9.4) [9.2]	Intersection does not exist.		A (A) [A]	9.1 (9.4) [9.2]
NBTL					A (A) [A]	0.5 (1.0) [0.6]			A (A) [A]	0.5 (1.0) [0.6]
South Site Access / 3 Line										
EBLR	Intersection does not exist.				A (A) [A]	9.0 (9.4) [9.2]	Intersection does not exist.		A (A) [A]	9.0 (9.4) [9.2]
NBTL					A (A) [A]	0.0 (1.4) [0.7]			A (A) [A]	0.0 (1.4) [0.7]

Notes:
1. XX (XX) [XX]– Weekday Morning Peak Hour (Weekday Afternoon Peak Hour) [XX] Saturday Peak Hour
2. All delay values are in seconds (s).

5.0 TRAFFIC CONTROL EVALUATION

5.1 TRAFFIC SIGNAL WARRANTS

In order to ensure that the road network in the vicinity of the Site maintains acceptable operations in the future, the need for traffic signals was considered at the proposed new Site access on Wellington Road 19 and at the intersections of **Wellington Road 19 / 3 Line** and **Wellington Road / 2 Line**, under 2038 future conditions.

For the Site access on Wellington Road 19, the traffic signal warrant analysis was based on the Ontario Traffic Manual (OTM) Book 12 methodology (Justification 7), while for the existing (two-way stop control) intersections, Justifications 1, 2 and 3 were used.

The traffic signal warrant assessments were based on the Ontario Traffic Manual (OTM) Book 12. It is noted that the Ontario Traffic Manual Book 12 - Traffic Signals, was updated in July 2024. For Justification 7, the new thresholds to warrant traffic signals are as follows:

- **Case 1**: The traffic signal is **undoubtedly warranted** - the suggested threshold for this condition is meeting 200% or more of Justifications 1 or 2.
- **Case 2**: The traffic signal **might be warranted** - falls between cases 1 and 3, somewhere between 100% and 199% of Justifications 1 or 2.
- **Case 3**: Signal warrant is **unlikely** – meets less than 100% of Justifications 1 or 2.

It is important to note that there are inconsistencies within the OTM Book 12 updated Justification 7 traffic signal warrant spreadsheets, for the automation of the “Case” column. The traffic signal warrant assessments for this report follow the above-noted thresholds, as outlined in OTM Book 12 on Page 146.

All relevant excerpts and detailed analysis, for the traffic signal warrant assessments, is provided in **Appendix E.**

5.1.1 Traffic Signal Warrants at Wellington Road/ 3 Line

The results of the traffic signal warrant analysis for the intersection of Wellington Road / 3 Line are summarized in **Table 7**. Based on the traffic signal warrant assessment, under future total conditions in 2038, traffic signals are not warranted under Justifications 1 or 2 at the intersections of Wellington Road 19 & 3 Line (57% compliance).

TABLE 7 TRAFFIC SIGNAL WARRANTS (2038) – WELLINGTON ROAD 19 / 3 LINE

Justification	Description	Required	Hour Ending								Percentage Compliance	
		1 Lane [Free Flow]	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Average	Sectional
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches	480	570	642	569	571	598	708	911	789		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	98%	54%
	B. Vehicle volume, minor streets	120	89	89	55	40	47	54	91	53		
		100%	74%	74%	46%	34%	39%	45%	76%	44%	54%	
2. Delay to Cross Traffic	A. Vehicle volume, major street	480	553	553	514	531	550	654	820	736		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	B. Combined vehicle/pedestrian volume crossing artery from minor street	50	13	51	21	22	23	25	59	24		**57%**
		100%	27%	100%	42%	44%	45%	50%	100%	48%	57%	
Overall Compliance is 57%[2]												

Notes:
1. Relevant OTM excerpts are provided in **Appendix E**.
2. Justifications 1 and 2 do not reach 80% compliance, and so Justification 3 does not apply in this case.

5.1.2 Traffic Signal Warrants at Wellington Road/ 2 Line

The results of the traffic signal warrant analysis for the intersection of Wellington Road / 2 Line are summarized in **Table 8**. Based on the traffic signal warrant assessment, under future total conditions in 2038, traffic signals are not quite warranted under Justifications 1 or 2 at the intersections of Wellington Road 19 & 2 Line (98% compliance). However, as the compliance score is 98% (peak summer months in 2038) for Justification 1, and because Justification 2 reaches 81%, the warrant is met under Justification 3 (combination warrant). As such, the County should continue to monitor this intersection to determine if traffic signals are required in the future, as the need for a traffic signal will be dependent upon future growth along Wellington Road 19 being fully realized or exceeding projections.

TABLE 8 TRAFFIC SIGNAL WARRANTS (2038) – WELLINGTON ROAD 19 / 2 LINE

Justification	Description	Required	Hour Ending								Percentage Compliance	
		1 Lane [Free Flow]	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Average	Sectional
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches	480	1062	1017	636	633	694	827	1126	1143		**98%**
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	B. Vehicle volume, minor streets	120	219	219	103	147	143	176	282	254		
		100%	100%	100%	80%	100%	100%	100%	100%	100%	98%	
2. Delay to Cross Traffic	A. Vehicle volume, major street	480	798	798	533	486	551	651	844	889		81%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	B. Combined vehicle/pedestrian volume crossing artery from minor street	64	58	19	34	31	46	71	66	64		
		100%	100%	38%	68%	62%	80%	100%	100%	100%	81%	
Overall Compliance is 98% Signal is Warranted under Justification 3[2]												

Notes:
1. Relevant OTM excerpts are provided in **Appendix E**.
2. Justifications 1 and 2 both reach 80% compliance and so Justification 3 applies.

5.1.3 Traffic Signal Warrants at Wellington Road/ Site Access/ Golf Club

The results of the traffic signal warrant analysis for the intersection of Wellington Road / Site Access/ Golf Club, based on OTM Justification 7, are summarized in **Table 9**. Based on the traffic signal warrant assessment, under future total conditions in 2038, traffic signals are “unlikely to be warranted” at the intersection of Wellington Road / Site Access/ Golf Club (80% compliance).

TABLE 9 TRAFFIC SIGNAL WARRANTS (2038) – WELLINGTON ROAD 19 & SITE ACCESS/GOLF CLUB

Justification	Description	Minimum Requirement 1 Lane Highways [Free Flow]	Compliance		
			Sectional		Sectional %[1]
		Base	Actual Traffic Volumes	% of Required	
Wellington Road 19 / Site Access					
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	476	99%	75%
	B. Vehicle volume, along minor streets (average hour)	120	91	76%	
2. Delay to Cross Traffic	A. Vehicle volume, major street (average hour)	480	385	80%	**80%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	63	125%	
Overall Compliance is 80%					

Notes:

1. Signals assessed based on Justification 7 are certainly warranted if a 200% compliance is reached, may be warranted if a 100-199% compliance is reached, and are unlikely to be warranted if less than a 100% compliance is reached.
2. Average hourly volumes were derived based on the formula presented in the OTM Book 12.
   AHV = (weekday morning peak hour volumes + weekday afternoon peak hour volumes) ÷ 4
3. Relevant OTM excerpts are provided in **Appendix E**.

5.2 ALL-WAY STOP CONTROL WARRANT

An assessment for all-way stop control was also undertaken at the intersection of **Wellington Road 19 / 3 Line**, under 2038 future conditions. The warrant methodology outlined in OTM Book 5 was applied to determine whether all-way stop control is appropriate. The requirements for this warrant were not met, whether the intersection is considered a major road intersection or a minor road intersection. Thus, the existing two-way stop control is considered to be appropriate for this intersection under 2038 future total conditions.

All-way stop control warrant assessments for the intersection of **Wellington Road 19 / 3 Line** are summarized in **Table 10**.

TABLE 10 ALL-WAY STOP CONTROL WARRANT SUMMARY – WELLINGTON ROAD 19 / 3 LINE

Hour	Intersection Volume				Warrant Requirements		
	Major Street	Minor Street	Total	Minor Street %	Total Volume Exceeds Threshold[1]	Minor Street Volume Exceeds Threshold[2]	Major / Minor Split is Less than 70/30
Warrant for Collector Roads and Rural Arterial Roads							
7:00-8:00	520	51	570	9%	Yes	No	No
8:00-9:00	553	89	642	14%	Yes	No	No
11:00-12:00	514	55	569	10%	Yes	No	No
12:00-13:00	531	40	571	7%	Yes	No	No
13:00-14:00	550	47	598	8%	Yes	No	No
15:00-16:00	654	54	708	8%	Yes	No	No
16:00-17:00	820	91	911	10%	Yes	No	No
17:00-18:00	736	53	789	7%	Yes	No	No
Average	**610**	**60**	**670**	**9%**	**All-Way Stop Control Not Warranted**		
Warrant for Local Roads							
8:00-9:00	520	51	570	9%	Yes	No	No
15:00-16:00	654	54	708	8%	Yes	No	No
16:00-17:00	820	91	911	10%	Yes	Yes	No
17:00-18:00	736	53	789	7%	Yes	No	No
Average	**682**	**62**	**745**	**8%**	**All-Way Stop Control Not Warranted**		

Notes:

1. For collector roads and rural arterial roads, the total intersection volume threshold is **375 vehicles** in the busiest eight hours of the day. For local roads, the total intersection volume threshold is **200 vehicles** in the busiest four hours of the day.
2. For collector roads and rural arterial roads, the minor street volume threshold is 150 vehicles in the busiest eight hours of the day, or 120 vehicles with a delay greater than 30 seconds for all vehicles in the busiest eight hours of the day. For local roads, the minor street volume threshold is 75 vehicles in the busiest four hours of the day.
3. Relevant OTM excerpts are provided in **Appendix E**.

6.0 SIGHT DISTANCE EVALUATION

6.1 WELLINGTON ROAD 19/ SITE ACCESS/ GOLF CLUB DRIVEWAY

A comprehensive sight distance review was completed for the proposed new Site access (Street A) / Golf Club driveway along Wellington Road 19 and is provided in **Appendix F**.

The sight distances were evaluated in accordance with Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, using a conservative design speed of 100 km/h (20 km/h over the speed limit of 80 km/h).

As shown in **Table 11**, the minimum required sight distances along Wellington Road 19 at the proposed Site access point (Street A) / Golf Club driveway are met. Only critical left-turn maneuvers were tested as any right-turn maneuvers require less sight distance. **It is important to note that the available sight distance is dependent on the right-of-way being kept clear of vertical obstructions up to the ditch line. Tree trimming may be required to maintain adequate sight distance.**

TABLE 11 SIGHT DISTANCE (WELLINGTON ROAD 19 AT SITE ACCESS/ GOLF CLUB DRIVEWAY)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Turning Sight Distance from Left or right (Design Speed of 100 km/h)		
Site Access (Street A) at Wellington Road 19		
Left turn from Site access (Street A) to Wellington Road 19[1]	210	930
Right turn from Site access (Street A) to Wellington Road 19[1]	210	275
Golf Club Driveway (re-located to align with new Site access) at Wellington Road 19		
Left turn from Golf Club Driveway to Wellington Road 19[1]	210	930
Right turn from Golf Club Driveway to Wellington Road 19[1]	210	315

Notes:
1. Transportation Association of Canada (TAC) Manual, Case B1; Table 9.9.3

6.2 3 LINE (STREET A AND STREET G)

A comprehensive sight distance review was completed for the proposed two new Site accesses (at Street A and at Street G) along 3 Line, and is provided in **Appendix F**.

The sight distances were evaluated in accordance with Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, using a conservative design speed of 80 km/h.

As shown in **Table 12**, the minimum required sight distance along 3 Line at both of the proposed Site access points are met. Only critical left-turn maneuvers were tested as any right-turn maneuvers require less sight

distance. **It is important to note that the available sight distance is dependent on the right-of-way being kept clear of vertical obstructions up to the ditch line.**

TABLE 12 SIGHT DISTANCE (3 LINE AT STREET A AND STREET G)

Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Turning Sight Distance from Left or right (Design Speed of 80 km/h)		
Street A		
Left turn from Street A onto 3 Line[1]	170	>170
Street G		
Left turn from Street G onto 3 Line[1]	170	>170

Notes:
1. Transportation Association of Canada (TAC) Manual, Case B1; Table 9.9.3

7.0 EVALUATION FOR LEFT-TURN LANES

As part of this report, detailed evaluations regarding the need for left-turn lanes on Wellington Road 19 at the proposed Site access point (Street A) / Golf Club driveway and on Wellington Road 19 / 3 Line, were completed using the Ministry of Transportation Ontario (MTO) Geometric Design Standards for Ontario Highways. Since the defacto speed limit on Wellington Road 19 is 80 km/h, in order to be conservative, the evaluation was completed for a design speed of 100 km/h.

7.1 WELLINGTON ROAD 19 & SITE ACCESS/ GOLF CLUB DRIVEWAY

The highest left-turning volume from Wellington Road 19 at the Site access was estimated to be 75 vehicles per hour and occurs during the weekday afternoon peak period. The highest left-turning volume from Wellington Road 19 at the re-located golf club driveway was estimated to be 15 vehicles per hour and occurs during the weekday afternoon and Saturday peak period. As shown in the detailed evaluation in **Appendix H**, left-turn lanes are warranted on Wellington Road 19 at the Site access / re-located Golf Club driveway. For this reason, as part of the redevelopment of the Site, the construction of eastbound and westbound left-turning lanes is recommended on Wellington Road 19 at the Site access (Street A) / Golf Club driveway.

7.2 WELLINGTON ROAD 19 & 3 LINE

The highest westbound left-turning volume on Wellington Road 19 at 3 Line, was estimated to be 15 vehicles per hour during weekday afternoon peak period and up to 30 vehicles during the Saturday peak period. As shown in the detailed evaluation in **Appendix H**, left-turn lanes are warranted on Wellington Road 19 & 3 Line, under 2038 future background conditions, during the Saturday peak hour. For these reasons, it is recommended that this intersection be monitored by the County in the future to assess the need for a westbound left-turn lane on Wellington Road 19 at 3 Line in the future.

7.3 WELLINGTON ROAD 19 & 2 LINE

Under existing conditions, the westbound left-turning volume on Wellington Road 19 at 2 Line, is 65 vehicles during the afternoon peak hour and 75 vehicles during the Saturday peak hour. As shown in the detailed evaluation in **Appendix H**, a westbound left-turn lane is warranted on Wellington Road 19 & 2 Line, under existing conditions, during the weekday afternoon peak hour and during the Saturday peak hour. It is recommended that the County assess and monitor this intersection to confirm the need for a westbound left-turn lane on Wellington Road 19 at 2 Line.

8.0 SUMMARY AND CONCLUSIONS

BA Group was retained by Fergus Land Holdings Limited c/o Fergus Development Inc. to provide transportation consulting services related to a proposed residential re-development on a site municipally known as 8243 & 8282 Wellington Road 19, in the Township of Centre Wellington, in the County of Wellington. The existing golf course (the "Site") consists of two parcels; the northwest parcel ("NW Site"), situated on the north side of Wellington Road 19, and the southeast parcel ("SE Site"), situated on the south side of Wellington Road 19.

The proposed development includes the construction of 446 single-detached residential dwellings. The proposed Site circulation includes a public road network inclusive of minor collectors (20-metre right-of-way) and local streets (18-metre right-of-way), with one full-movement access on Wellington Road 19 that aligns to form a 4-legged intersection with the relocated main golf club driveway and two full-movement accesses along 3 Line. Once the golf club driveway on Wellington Road 19 has been shifted to the new location, the existing driveway will remain open for service vehicles only. An additional new driveway for water/ waste water treatment vehicles is also to be provided along the north side of Wellington Road 19. The one site access on Wellington Road 19 and the two accesses on 3 Line, will be unsignalized with stop control on the minor street only.

Key findings of the Transportation Considerations Report are summarized as follows:

Transportation Context

- The Site is adjacent to Wellington Road 19 and 3 Line. Wellington Road 19 is a Wellington County arterial road and 3 Line is a Wellington County local road.
- The Township of Centre Wellington does not currently operate a local public transit system and there are no plans at this time to establish transit service in the vicinity of the Site.
- In the vicinity of the Site, Wellington Road 19 includes paved shoulders for cyclists and there are future plans to extend the paved shoulders east of 3 Line.
- Just south of Wellington Route 19, there is an off-road “spine route” know as the Elora Cataract Trail, a 47km long trail between Elora and Forks of Credit Provincial Park. The trail is located along the southern edge of the SE Site, and crosses 2 Line, 150m southeast of Wellington Road 19.
- There is a pedestrian tunnel under Wellington Road 19 which provides connectivity between the SE Site and the NW Site, with access through the proposed park. The tunnel will be secured with an easement to the golf course. The proposed public road network for the Site includes sidewalks along one side of the road.

Traffic Operations Analysis

- The Site is forecast to generate 335, 445 and 410 two-way residential vehicle trips during the weekday morning, weekday afternoon and Saturday peak hours, respectively.

- The golf club is expected to generate in the order of 35 two-way vehicle trips during the weekday morning peak hour and 55 two-way vehicle trips during the weekday afternoon and Saturday peak hours. Since no information regarding existing traffic associated with the golf course on the NW Site was available, a conservative approach was adopted, wherein the estimated vehicle trips were added to the network to account for the new golf course entrance, and no traffic was removed.

- All intersections in the study area, including the Site access points, are expected to operate under capacity under future total conditions.

- In order to ensure that the road network in the vicinity of the Site maintains acceptable operations in the future, the need for traffic signals was considered at the proposed new Site access on Wellington Road 19 and at the intersections of Wellington Road 19 / 3 Line and Wellington Road / 2 Line, under 2038 future conditions.

- The results of the traffic signal warrant analysis for the intersection of Wellington Road / 3 Line determined that under future total conditions in 2038, traffic signals are not warranted under Justifications 1 or 2 at the intersections of Wellington Road 19 & 3 Line (57% compliance).

- The results of the traffic signal warrant analysis for the intersection of Wellington Road / 2 Line determined that under future total conditions in 2038, traffic signals are not quite warranted under Justifications 1 or 2 at the intersections of Wellington Road 19 & 2 Line (98% compliance). However, as the compliance score is 98% (peak summer months in 2038) for Justification 1, and because Justification 2 reaches 81%, the warrant is met under Justification 3 (combination warrant). For these reasons, the County should continue to monitor this intersection to determine if traffic signals are required in the future, as the need for a traffic signal will be dependent upon future growth being fully realized or exceeding projections.

- The results of the traffic signal warrant analysis for the intersection of Wellington Road / Site Access/ Golf Club determined that under future total conditions in 2038, traffic signals are “unlikely to be warranted” at the intersection of Wellington Road / Site Access/ Golf Club (80% compliance).

Sight Distance Assessment

- Comprehensive sight distance reviews were completed along Wellington Road 19 at the proposed Site access (Street A) / golf club driveway intersection and along 3 Line at both proposed Site access points (Street A and at Street G), utilizing both the vertical and horizontal profile data obtained from surveys. All minimum required sight distances are met along both Wellington Road 19 and along 3 Line.

- It is important to note that the available sight distances are dependent on the right-of-ways being kept clear of vertical obstructions up to the ditch line. **Tree trimming may be required to maintain adequate sight distance, particularly at the Site access along Wellington Road 19.**

Evaluation for Left-Turn Lanes along Wellington Road 19

- The evaluation for left-turn lanes on Wellington Road 19 at the proposed Site access (Street A) /relocated golf club driveway was completed for a design speed of 100 km/h. The highest left-turning volume at the Site access was estimated to be 75 vehicles per hour and occurs during the weekday afternoon peak period. The highest left-turning volume at the re-located golf club driveway was estimated to be 15 vehicles per hour and occurs during the weekday afternoon and Saturday peak period. As part of the redevelopment of the Site, the construction of eastbound and westbound left-turning lanes is recommended on Wellington Road 19 at the Site access (Street A) / relocated golf club driveway.

Based on the foregoing, with the implementation of the recommended road improvements, the proposed development can be accommodated on the future transportation network.

Appendix A
Development Concept Plan

Development Concept

Fergus Golf Course Redevelopment

Site Area: 39.7ha.
Lots: 446

- 52' - 19 Lots
- 45' - 116 Lots
- 38' - 183 Lots
- 32' - 128 Lots

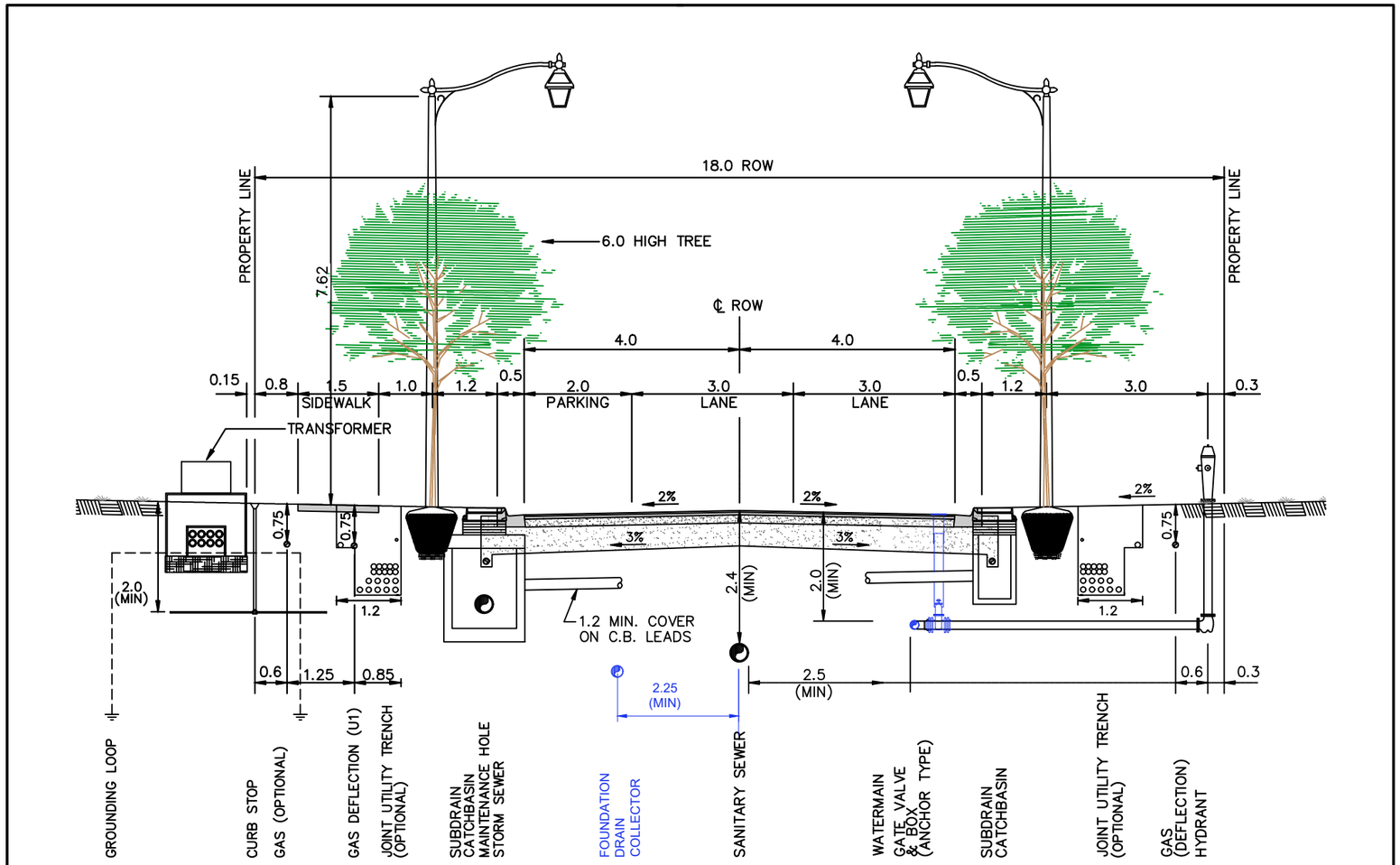
Drainage Easement

NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

June 1, 2026 | Project No.: 24128 | Drawn By: EF/MN

GSP group

Appendix B
Internal Road Network Cross-Section



NOTES:
1. TRANSFORMER TO BE PLACED AS PER TOWNSHIP STANDARD U1.
2. SIDEWALK ON OPPOSITE SIDE FROM HYDRANT UNLESS OTHERWISE NOTED.
3. TREE PLANTING ON BOTH SIDES.
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

MODIFICATIONS INCLUDE:
- ADDITION OF FOUNDATION DRAIN COLLECTOR
- LOCATION OF SIDEWALK
- LOCATION OF WATERMAIN

NOTES:
1. DO NOT SCALE DRAWINGS
2. ALL DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR DURING THE COURSE OF WORK

No	DATE	REVISION
1	APR 2023	DEVELOPMENT MANUAL

LOCAL STREET – 18m ROW
STANDARD CROSS SECTION

TOWNSHIP OF CENTRE WELLINGTON
1 MACDONALD SQUARE
ELORA, ONTARIO N0B 1S0

SCALE 1:100

STANDARD NUMBER R7

BURNSIDE

Client

FERGUS DEVELOPMENT INC.

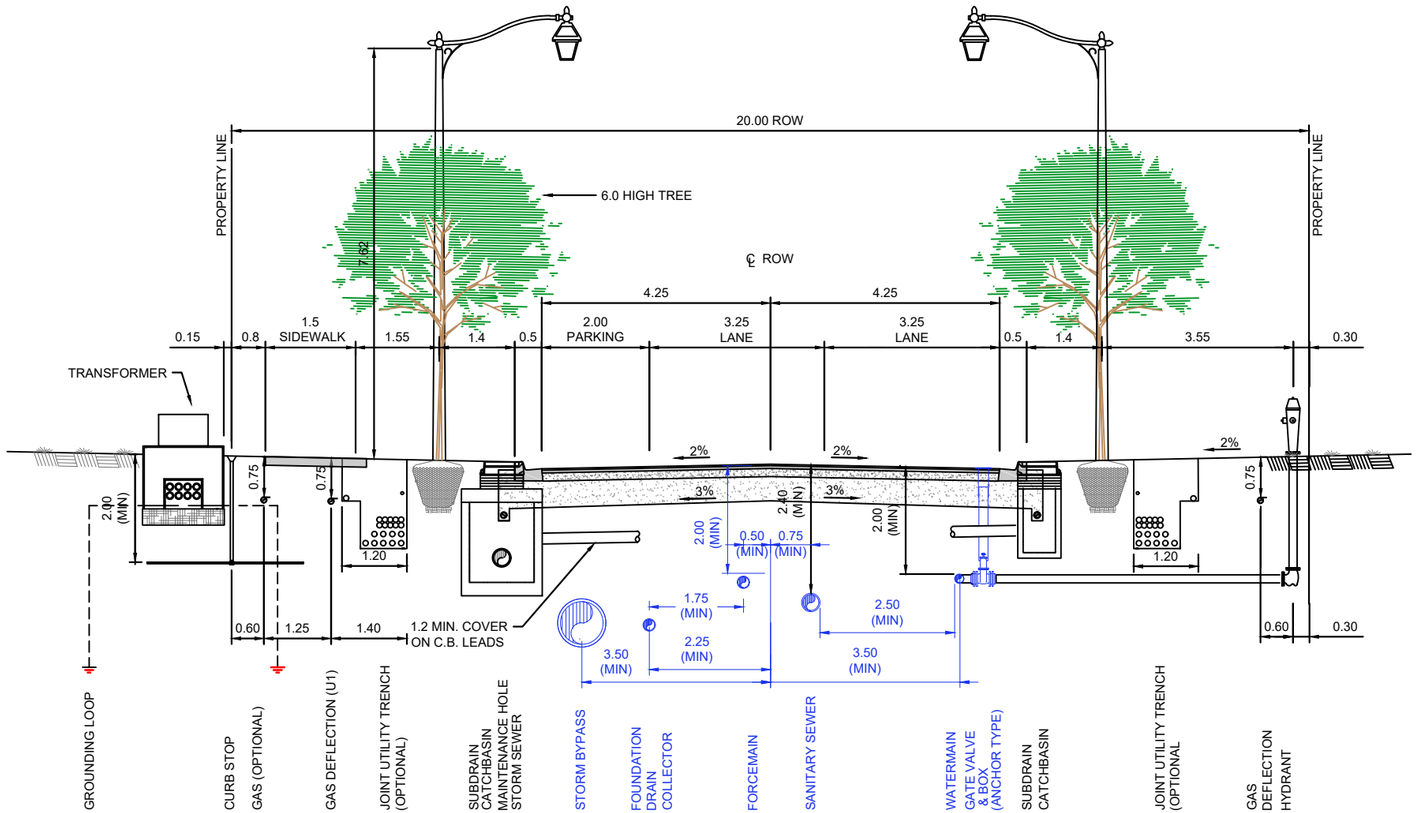
Figure Title

FERGUS GOLF COURSE REDEVELOPMENT

TYPICAL CROSS SECTION OF PROPOSED 18.0m RIGHT OF WAY

Drawn	Checked	Date	Figure No.
C.M.	M.B.	26/06/01	**8.1**
Scale		Project No.	
N.T.S.		052719.3000	

File: U:\052719\3000\03-PRD\FSR FIGURES_MISC\052719_RoadCrossSection_Detail.dwg Date Plotted: June 23, 2026 - 3:36 PM



NOTES:
1. TRANSFORMER TO BE PLACED AS PER TOWNSHIP STANDARD U1.
2. SIDEWALK ON OPPOSITE SIDE FROM HYDRANT UNLESS OTHERWISE NOTED.
3. TREE PLANTING ON BOTH SIDES.
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

MODIFICATIONS INCLUDE:
- ADDITION OF STORM BYPASS, FOUNDATION DRAIN COLLECTOR, AND SANITARY FORCEMAIN
- LOCATION OF SIDEWALK
- LOCATION OF SANITARY AND WATERMAIN

NOTES:
1. DO NOT SCALE DRAWINGS
2. ALL DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR DURING THE COURSE OF WORK

No	DATE	REVISION
1	APR 2023	DEVELOPMENT MANUAL

MINOR COLLECTOR - 20m ROW STANDARD CROSS SECTION

TOWNSHIP OF CENTRE WELLINGTON
1 MACDONALD SQUARE
ELORA, ONTARIO N0B 1S0

SCALE N.T.S.

STANDARD NUMBER R1

BURNSIDE

Client
FERGUS DEVELOPMENT INC.

Figure Title
FERGUS GOLF COURSE REDEVELOPMENT

TYPICAL CROSS SECTION OF PROPOSED 20.0m RIGHT OF WAY

Drawn	Checked	Date	Figure No.
C.M.	M.B.	26/06/01	8.2
Scale		Project No.	
N.T.S.		052719.3000	

Appendix C
Traffic Counts

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (2 . WELLINGTON RD 19 & 2 LINE)

Start Time	N Approach 2 LINE						E Approach WELLINGTON RD 19						S Approach 2 LINE						W Approach WELLINGTON RD 19						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
11:00:00	2	5	1	0	0	8	3	57	20	0	0	80	30	7	6	0	0	43	1	53	2	0	0	56	187	
11:15:00	4	10	1	0	0	15	4	68	13	0	0	85	11	11	1	0	0	23	2	45	2	0	0	49	172	
11:30:00	3	4	0	0	0	7	3	55	15	0	0	73	37	12	1	0	0	50	1	45	3	0	0	49	179	
11:45:00	5	6	2	0	0	13	2	58	12	0	0	72	28	14	3	0	0	45	1	53	5	0	0	59	189	727
12:00:00	2	8	7	0	0	17	7	42	14	0	0	63	34	7	6	0	0	47	3	52	5	0	0	60	187	727
12:15:00	1	9	1	0	0	11	1	70	12	0	0	83	24	8	2	0	0	34	1	49	8	0	0	58	186	741
12:30:00	7	8	0	0	0	15	2	54	19	0	0	75	23	7	2	0	0	32	3	50	2	0	0	55	177	739
12:45:00	6	6	3	0	0	15	3	51	12	0	0	66	21	1	1	0	0	23	2	50	1	0	0	53	157	707
13:00:00	2	7	6	0	0	15	5	45	11	0	0	61	21	6	3	0	0	30	4	41	2	0	0	47	153	673
13:15:00	2	12	2	0	0	16	4	48	13	0	0	65	26	7	7	0	0	40	1	51	3	0	0	55	176	663
13:30:00	4	7	2	0	0	13	2	50	12	0	0	64	33	9	0	0	0	42	2	47	2	0	0	51	170	656
13:45:00	4	3	1	0	0	8	3	56	15	0	0	74	29	9	3	0	0	41	4	63	2	0	0	69	192	691
14:00:00	3	6	1	0	0	10	5	60	22	0	0	87	21	8	1	0	0	30	4	62	2	0	0	68	195	733
14:15:00	0	6	5	0	0	11	2	53	20	0	0	75	21	3	3	0	0	27	1	62	4	0	0	67	180	737
14:30:00	3	10	3	0	0	16	1	43	17	0	0	61	26	10	4	0	0	40	3	53	2	0	0	58	175	742
14:45:00	3	5	2	0	0	10	3	50	10	0	0	63	25	6	5	0	0	36	1	60	2	0	0	63	172	722
Grand Total	51	112	37	0	0	200	50	860	237	0	0	1147	410	125	48	0	0	583	34	836	47	0	0	917	**2847**	-
Approach%	25.5%	56%	18.5%	0%		-	4.4%	75%	20.7%	0%		-	70.3%	21.4%	8.2%	0%		-	3.7%	91.2%	5.1%	0%		-	**-**	-
Totals %	1.8%	3.9%	1.3%	0%		7%	1.8%	30.2%	8.3%	0%		40.3%	14.4%	4.4%	1.7%	0%		20.5%	1.2%	29.4%	1.7%	0%		32.2%	**-**	-
Heavy	0	4	3	0		-	1	5	1	0		-	3	5	0	0		-	0	3	0	0		-	**-**	-
Heavy %	0%	3.6%	8.1%	0%		-	2%	0.6%	0.4%	0%		-	0.7%	4%	0%	0%		-	0%	0.4%	0%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	1	1	0		-	2	0	1	0		-	1	0	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0.1%	0.4%	0%		-	0.5%	0%	2.1%	0%		-	2.9%	0%	0%	0%		-	**-**	-

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 01:45 PM - 02:45 PM Weather: Clear Sky (20.39 °C)

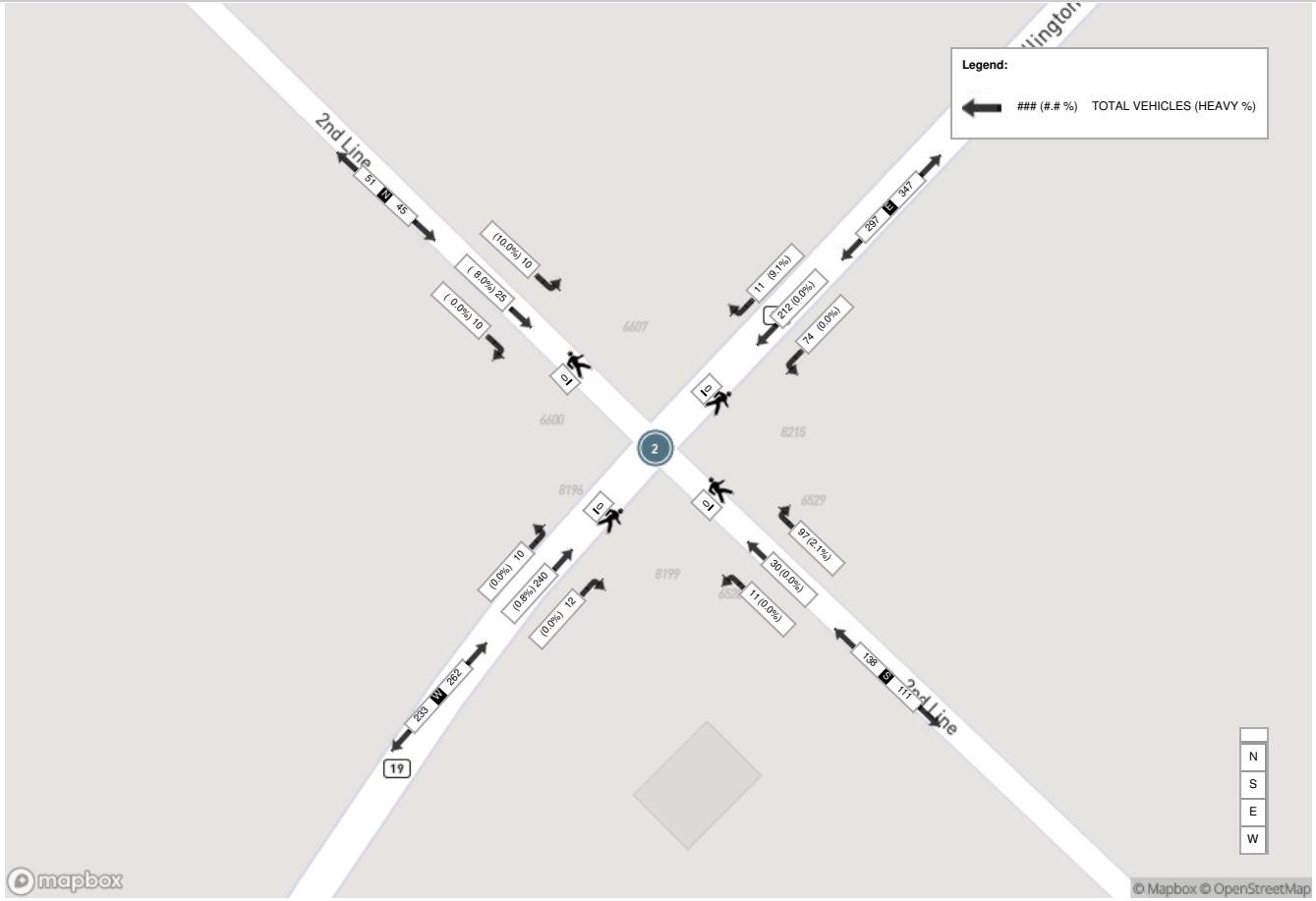
Start Time	N Approach 2 LINE						E Approach WELLINGTON RD 19						S Approach 2 LINE						W Approach WELLINGTON RD 19						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
13:45:00	4	3	1	0	0	8	3	56	15	0	0	74	29	9	3	0	0	41	4	63	2	0	0	69	192
14:00:00	3	6	1	0	0	10	5	60	22	0	0	87	21	8	1	0	0	30	4	62	2	0	0	68	195
14:15:00	0	6	5	0	0	11	2	53	20	0	0	75	21	3	3	0	0	27	1	62	4	0	0	67	180
14:30:00	3	10	3	0	0	16	1	43	17	0	0	61	26	10	4	0	0	40	3	53	2	0	0	58	175
Grand Total	10	25	10	0	0	45	11	212	74	0	0	297	97	30	11	0	0	138	12	240	10	0	0	262	**742**
Approach%	22.2%	55.6%	22.2%	0%		-	3.7%	71.4%	24.9%	0%		-	70.3%	21.7%	8%	0%		-	4.6%	91.6%	3.8%	0%		-	**-**
Totals %	1.3%	3.4%	1.3%	0%		6.1%	1.5%	28.6%	10%	0%		40%	13.1%	4%	1.5%	0%		18.6%	1.6%	32.3%	1.3%	0%		35.3%	**-**
PHF	0.63	0.63	0.5	0		0.7	0.55	0.88	0.84	0		0.85	0.84	0.75	0.69	0		0.84	0.75	0.95	0.63	0		0.95	**-**
Heavy	0	2	1	0		3	1	0	0	0		1	2	0	0	0		2	0	2	0	0		2	**-**
Heavy %	0%	8%	10%	0%		6.7%	9.1%	0%	0%	0%		0.3%	2.1%	0%	0%	0%		1.4%	0%	0.8%	0%	0%		0.8%	**-**
Lights	10	23	9	0		42	10	212	74	0		296	95	30	11	0		136	12	238	10	0		260	**-**
Lights %	100%	92%	90%	0%		93.3%	90.9%	100%	100%	0%		99.7%	97.9%	100%	100%	0%		98.6%	100%	99.2%	100%	0%		99.2%	**-**
Single-Unit Trucks	0	0	0	0		0	1	0	0	0		1	2	0	0	0		2	0	2	0	0		2	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	9.1%	0%	0%	0%		0.3%	2.1%	0%	0%	0%		1.4%	0%	0.8%	0%	0%		0.8%	**-**
Articulated Trucks	0	2	1	0		3	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	8%	10%	0%		6.7%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 01:45 PM - 02:45 PM Weather: Clear Sky (20.39 °C)



Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (2 . WELLINGTON RD 19 & 2 LINE)

Start Time	N Approach 2 LINE						E Approach WELLINGTON RD 19						S Approach 2 LINE						W Approach WELLINGTON RD 19						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	3	5	0	0	0	8	1	21	9	0	0	31	15	2	0	0	0	17	1	22	0	0	0	23	79	
07:15:00	1	12	1	0	0	14	2	21	7	0	0	30	5	1	1	0	0	7	2	19	0	0	0	21	72	
07:30:00	4	11	5	0	0	20	2	24	15	0	0	41	8	3	0	0	0	11	0	27	1	0	0	28	100	
07:45:00	4	6	2	0	0	12	1	36	10	0	0	47	15	17	3	0	0	35	0	25	1	0	0	26	120	371
08:00:00	3	10	2	0	0	15	0	35	19	0	0	54	9	6	1	0	0	16	1	24	3	0	0	28	113	405
08:15:00	3	4	2	0	0	9	2	33	18	0	0	53	10	10	0	0	0	20	3	25	1	0	0	29	111	444
08:30:00	1	1	1	0	0	3	1	29	13	0	0	43	18	6	0	0	0	24	0	35	3	0	0	38	108	452
08:45:00	8	7	2	0	0	17	1	41	10	0	0	52	9	8	0	0	0	17	8	24	0	0	0	32	118	450
BREAK																										
16:00:00	4	7	0	0	0	11	4	40	17	0	0	61	30	9	2	0	0	41	2	38	5	0	0	45	158	
16:15:00	8	9	2	0	0	19	2	50	16	0	0	68	17	10	2	0	0	29	1	36	3	0	0	40	156	
16:30:00	4	5	1	0	0	10	3	47	15	0	0	65	26	11	6	0	0	43	2	53	1	0	0	56	174	
16:45:00	7	4	2	0	0	13	5	37	19	0	0	61	21	9	2	0	0	32	4	54	6	0	0	64	170	658
17:00:00	1	8	0	0	0	9	7	55	13	0	0	75	21	15	3	0	0	39	2	49	9	0	0	60	183	683
17:15:00	2	7	2	0	0	11	6	25	12	0	0	43	19	8	4	0	0	31	5	39	6	1	0	51	136	663
17:30:00	7	10	0	0	0	17	2	38	8	0	0	48	15	15	1	0	0	31	2	34	4	0	0	40	136	625
17:45:00	6	8	2	0	0	16	0	20	10	0	0	30	11	6	3	0	0	20	4	35	5	0	0	44	110	565
Grand Total	66	114	24	0	0	204	39	552	211	0	0	802	249	136	28	0	0	413	37	539	48	1	0	625	**2044**	-
Approach%	32.4%	55.9%	11.8%	0%		-	4.9%	68.8%	26.3%	0%		-	60.3%	32.9%	6.8%	0%		-	5.9%	86.2%	7.7%	0.2%		-	**-**	-
Totals %	3.2%	5.6%	1.2%	0%		10%	1.9%	27%	10.3%	0%		39.2%	12.2%	6.7%	1.4%	0%		20.2%	1.8%	26.4%	2.3%	0%		30.6%	**-**	-
Heavy	2	6	1	0		-	2	19	6	0		-	11	11	1	0		-	1	17	0	0		-	**-**	-
Heavy %	3%	5.3%	4.2%	0%		-	5.1%	3.4%	2.8%	0%		-	4.4%	8.1%	3.6%	0%		-	2.7%	3.2%	0%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 07:45 AM - 08:45 AM Weather: Clear Sky (19.12 °C)

Start Time	N Approach 2 LINE						E Approach WELLINGTON RD 19						S Approach 2 LINE						W Approach WELLINGTON RD 19						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:45:00	4	6	2	0	0	12	1	36	10	0	0	47	15	17	3	0	0	35	0	25	1	0	0	26	120
08:00:00	3	10	2	0	0	15	0	35	19	0	0	54	9	6	1	0	0	16	1	24	3	0	0	28	113
08:15:00	3	4	2	0	0	9	2	33	18	0	0	53	10	10	0	0	0	20	3	25	1	0	0	29	111
08:30:00	1	1	1	0	0	3	1	29	13	0	0	43	18	6	0	0	0	24	0	35	3	0	0	38	108
Grand Total	11	21	7	0	0	39	4	133	60	0	0	197	52	39	4	0	0	95	4	109	8	0	0	121	**452**
Approach%	28.2%	53.8%	17.9%	0%		-	2%	67.5%	30.5%	0%		-	54.7%	41.1%	4.2%	0%		-	3.3%	90.1%	6.6%	0%		-	**-**
Totals %	2.4%	4.6%	1.5%	0%		8.6%	0.9%	29.4%	13.3%	0%		43.6%	11.5%	8.6%	0.9%	0%		21%	0.9%	24.1%	1.8%	0%		26.8%	**-**
PHF	0.69	0.53	0.88	0		0.65	0.5	0.92	0.79	0		0.91	0.72	0.57	0.33	0		0.68	0.33	0.78	0.67	0		0.8	**-**
Heavy	1	0	0	0		1	0	4	3	0		7	5	2	0	0		7	0	8	0	0		8	**-**
Heavy %	9.1%	0%	0%	0%		2.6%	0%	3%	5%	0%		3.6%	9.6%	5.1%	0%	0%		7.4%	0%	7.3%	0%	0%		6.6%	**-**
Lights	10	21	7	0		38	4	129	57	0		190	47	37	4	0		88	4	101	8	0		113	**-**
Lights %	90.9%	100%	100%	0%		97.4%	100%	97%	95%	0%		96.4%	90.4%	94.9%	100%	0%		92.6%	100%	92.7%	100%	0%		93.4%	**-**
Single-Unit Trucks	0	0	0	0		0	0	4	3	0		7	2	0	0	0		2	0	5	0	0		5	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	3%	5%	0%		3.6%	3.8%	0%	0%	0%		2.1%	0%	4.6%	0%	0%		4.1%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	1	0	0	0		1	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	1.9%	0%	0%	0%		1.1%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	1	0	0	0		1	0	0	0	0		0	2	2	0	0		4	0	3	0	0		3	**-**
Articulated Trucks %	9.1%	0%	0%	0%		2.6%	0%	0%	0%	0%		0%	3.8%	5.1%	0%	0%		4.2%	0%	2.8%	0%	0%		2.5%	**-**

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.71 °C)

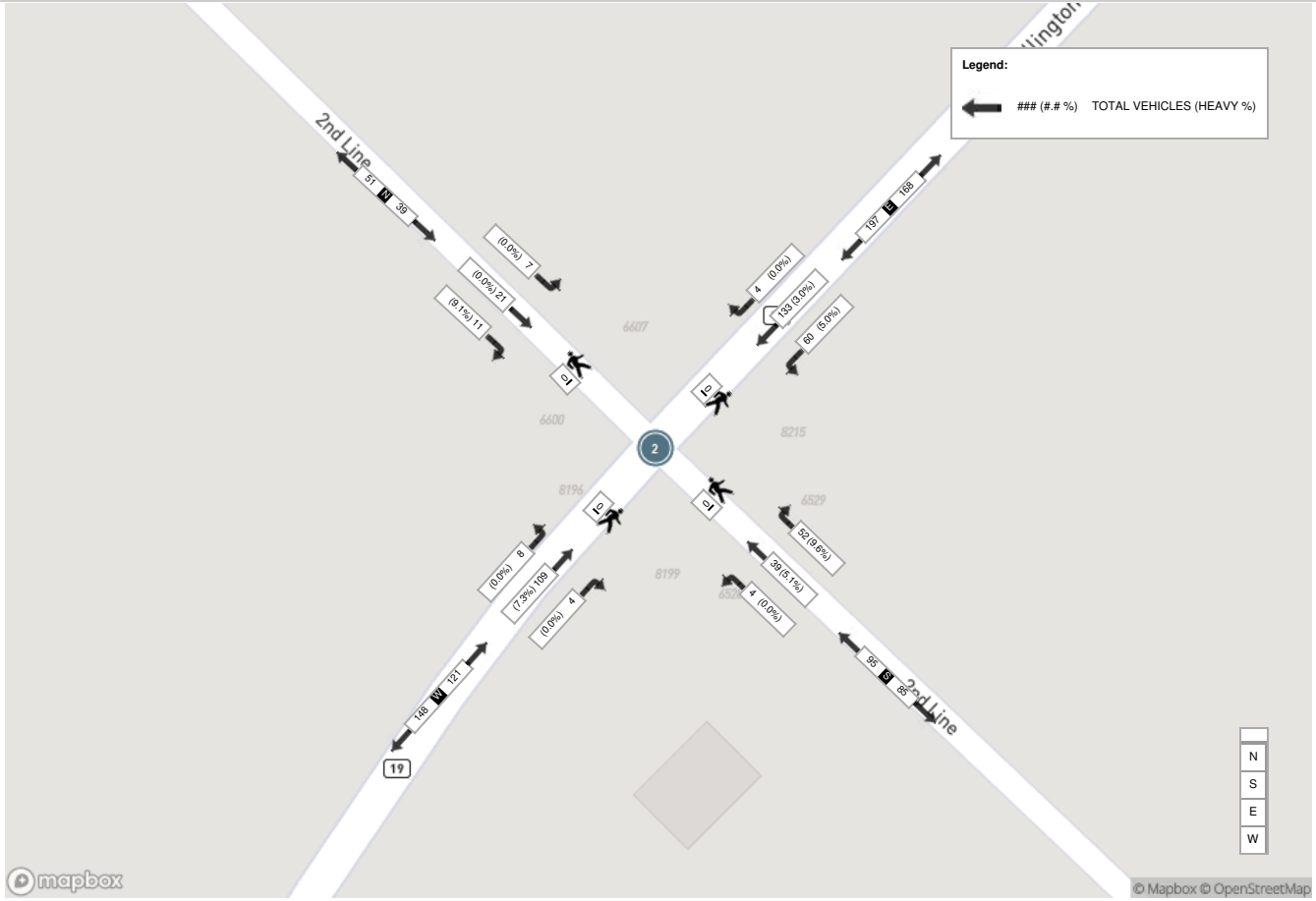
Start Time	N Approach 2 LINE						E Approach WELLINGTON RD 19						S Approach 2 LINE						W Approach WELLINGTON RD 19						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	8	9	2	0	0	19	2	50	16	0	0	68	17	10	2	0	0	29	1	36	3	0	0	40	156
16:30:00	4	5	1	0	0	10	3	47	15	0	0	65	26	11	6	0	0	43	2	53	1	0	0	56	174
16:45:00	7	4	2	0	0	13	5	37	19	0	0	61	21	9	2	0	0	32	4	54	6	0	0	64	170
17:00:00	1	8	0	0	0	9	7	55	13	0	0	75	21	15	3	0	0	39	2	49	9	0	0	60	183
Grand Total	20	26	5	0	0	51	17	189	63	0	0	269	85	45	13	0	0	143	9	192	19	0	0	220	**683**
Approach%	39.2%	51%	9.8%	0%		-	6.3%	70.3%	23.4%	0%		-	59.4%	31.5%	9.1%	0%		-	4.1%	87.3%	8.6%	0%		-	**-**
Totals %	2.9%	3.8%	0.7%	0%		7.5%	2.5%	27.7%	9.2%	0%		39.4%	12.4%	6.6%	1.9%	0%		20.9%	1.3%	28.1%	2.8%	0%		32.2%	**-**
PHF	0.63	0.72	0.63	0		0.67	0.61	0.86	0.83	0		0.9	0.82	0.75	0.54	0		0.83	0.56	0.89	0.53	0		0.86	**-**
Heavy	1	1	0	0		2	1	5	2	0		8	2	3	1	0		6	0	2	0	0		2	**-**
Heavy %	5%	3.8%	0%	0%		3.9%	5.9%	2.6%	3.2%	0%		3%	2.4%	6.7%	7.7%	0%		4.2%	0%	1%	0%	0%		0.9%	**-**
Lights	19	25	5	0		49	16	184	61	0		261	83	42	12	0		137	9	190	19	0		218	**-**
Lights %	95%	96.2%	100%	0%		96.1%	94.1%	97.4%	96.8%	0%		97%	97.6%	93.3%	92.3%	0%		95.8%	100%	99%	100%	0%		99.1%	**-**
Single-Unit Trucks	1	1	0	0		2	0	5	1	0		6	2	2	1	0		5	0	1	0	0		1	**-**
Single-Unit Trucks %	5%	3.8%	0%	0%		3.9%	0%	2.6%	1.6%	0%		2.2%	2.4%	4.4%	7.7%	0%		3.5%	0%	0.5%	0%	0%		0.5%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	1	0	1	0		2	0	1	0	0		1	0	1	0	0		1	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	5.9%	0%	1.6%	0%		0.7%	0%	2.2%	0%	0%		0.7%	0%	0.5%	0%	0%		0.5%	**-**

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 07:45 AM - 08:45 AM **Weather: Clear Sky (19.12 °C)**

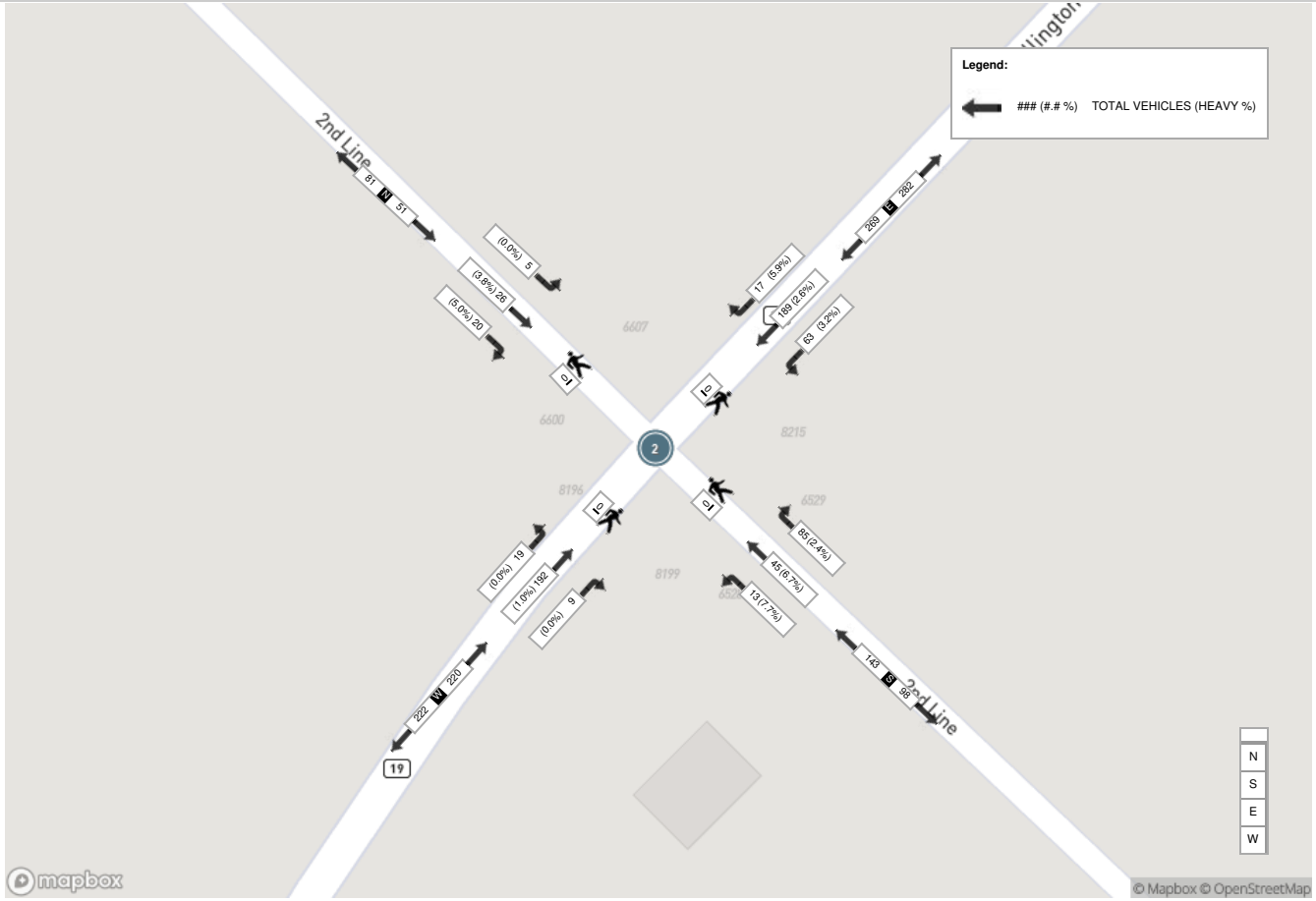


Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:15 PM - 05:15 PM **Weather: Broken Clouds (24.71 °C)**



Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (1 . WELLINGTON RD 19 & 3 LINE)

Start Time	N Approach THIRD LINE						E Approach WELLINGTON COUNTY RD 19						S Approach THIRD LINE						W Approach WELLINGTON COUNTY RD 19						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
11:00:00	0	0	0	0	0	0	0	66	6	0	0	72	5	0	10	0	0	15	12	70	0	0	0	82	169	
11:15:00	2	0	0	0	0	2	0	71	1	0	0	72	3	0	8	0	0	11	4	53	0	0	0	57	142	
11:30:00	0	0	0	0	0	0	0	67	0	0	0	67	2	0	3	0	0	5	7	64	0	0	0	71	143	
11:45:00	0	0	1	0	0	1	0	60	2	0	0	62	0	0	9	0	0	9	4	72	1	0	0	77	149	603
12:00:00	3	1	2	0	0	6	1	53	0	0	0	54	1	1	5	0	0	7	6	82	3	0	0	91	158	592
12:15:00	0	0	0	0	0	0	0	79	2	0	0	81	1	0	3	0	0	4	2	73	0	0	0	75	160	610
12:30:00	0	0	1	0	0	1	0	63	1	0	0	64	3	0	8	0	0	11	5	63	2	1	0	71	147	614
12:45:00	1	0	0	0	0	1	0	60	3	0	0	63	0	0	8	0	0	8	4	62	1	0	0	67	139	604
13:00:00	0	0	1	0	0	1	0	48	0	0	0	48	2	0	4	0	0	6	8	60	1	0	0	69	124	570
13:15:00	0	0	0	0	0	0	2	61	0	0	0	63	0	0	4	0	0	4	7	64	0	0	0	71	138	548
13:30:00	0	0	0	0	0	0	0	55	3	0	0	58	0	0	3	0	0	3	10	70	0	1	0	81	142	543
13:45:00	1	0	0	0	0	1	0	69	7	0	0	76	3	1	5	0	0	9	10	79	1	0	0	90	176	580
14:00:00	2	1	0	0	0	3	0	66	2	0	0	68	3	0	12	0	0	15	9	71	0	0	0	80	166	622
14:15:00	0	1	0	0	0	1	0	64	4	0	0	68	7	1	6	0	0	14	5	83	2	0	0	90	173	657
14:30:00	0	1	1	0	0	2	0	51	2	0	0	53	0	1	8	0	0	9	8	69	0	0	0	77	141	656
14:45:00	0	0	0	0	0	0	1	60	2	0	0	63	2	0	6	0	0	8	4	81	1	0	0	86	157	637
Grand Total	9	4	6	0	0	19	4	993	35	0	0	1032	32	4	102	0	0	138	105	1116	12	2	0	1235	**2424**	-
Approach%	47.4%	21.1%	31.6%	0%		-	0.4%	96.2%	3.4%	0%		-	23.2%	2.9%	73.9%	0%		-	8.5%	90.4%	1%	0.2%		-	**-**	-
Totals %	0.4%	0.2%	0.2%	0%		0.8%	0.2%	41%	1.4%	0%		42.6%	1.3%	0.2%	4.2%	0%		5.7%	4.3%	46%	0.5%	0.1%		50.9%	**-**	-
Heavy	1	0	0	0		-	0	9	0	0		-	0	0	0	0		-	0	7	2	0		-	**-**	-
Heavy %	11.1%	0%	0%	0%		-	0%	0.9%	0%	0%		-	0%	0%	0%	0%		-	0%	0.6%	16.7%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	1	0	0		-	2	0	1	0		-	0	1	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0.1%	0%	0%		-	6.3%	0%	1%	0%		-	0%	0.1%	0%	0%		-	**-**	-

Spectrum

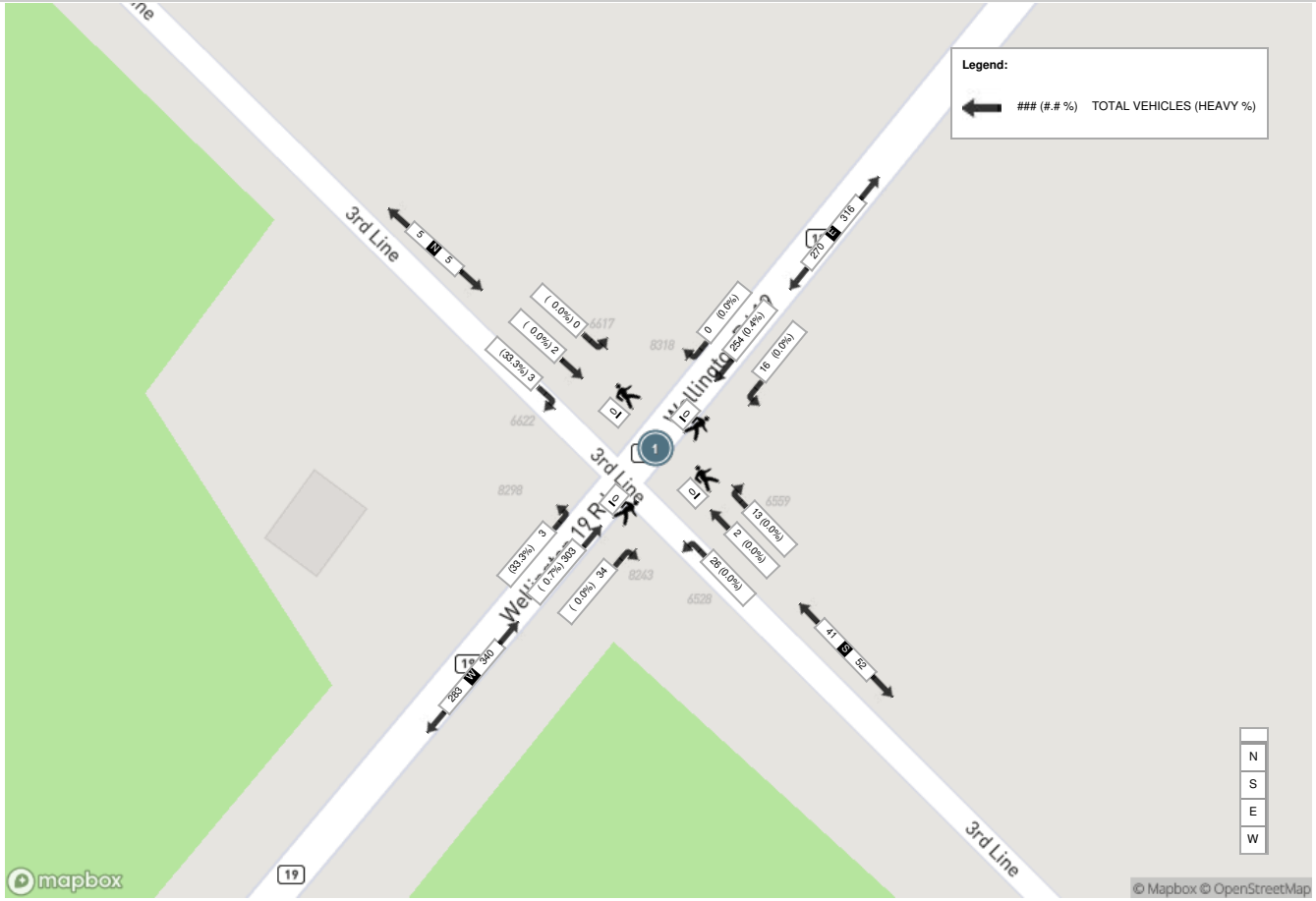
Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 01:30 PM - 02:30 PM Weather: Clear Sky (20.39 °C)

Start Time	N Approach THIRD LINE						E Approach WELLINGTON COUNTY RD 19						S Approach THIRD LINE						W Approach WELLINGTON COUNTY RD 19						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
13:30:00	0	0	0	0	0	0	0	55	3	0	0	58	0	0	3	0	0	3	10	70	0	1	0	81	142
13:45:00	1	0	0	0	0	1	0	69	7	0	0	76	3	1	5	0	0	9	10	79	1	0	0	90	176
14:00:00	2	1	0	0	0	3	0	66	2	0	0	68	3	0	12	0	0	15	9	71	0	0	0	80	166
14:15:00	0	1	0	0	0	1	0	64	4	0	0	68	7	1	6	0	0	14	5	83	2	0	0	90	173
Grand Total	3	2	0	0	0	5	0	254	16	0	0	270	13	2	26	0	0	41	34	303	3	1	0	341	**657**
Approach%	60%	40%	0%	0%		-	0%	94.1%	5.9%	0%		-	31.7%	4.9%	63.4%	0%		-	10%	88.9%	0.9%	0.3%		-	**-**
Totals %	0.5%	0.3%	0%	0%		0.8%	0%	38.7%	2.4%	0%		41.1%	2%	0.3%	4%	0%		6.2%	5.2%	46.1%	0.5%	0.2%		51.9%	**-**
PHF	0.38	0.5	0	0		0.42	0	0.92	0.57	0		0.89	0.46	0.5	0.54	0		0.68	0.85	0.91	0.38	0.25		0.95	**-**
Heavy	1	0	0	0		1	0	1	0	0		1	0	0	0	0		0	0	2	1	0		3	**-**
Heavy %	33.3%	0%	0%	0%		20%	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0.7%	33.3%	0%		0.9%	**-**
Lights	2	2	0	0		4	0	253	16	0		269	13	2	26	0		41	34	301	2	1		338	**-**
Lights %	66.7%	100%	0%	0%		80%	0%	99.6%	100%	0%		99.6%	100%	100%	100%	0%		100%	100%	99.3%	66.7%	100%		99.1%	**-**
Single-Unit Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	2	0	0		2	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.6%	**-**
Articulated Trucks	1	0	0	0		1	0	1	0	0		1	0	0	0	0		0	0	0	1	0		1	**-**
Articulated Trucks %	33.3%	0%	0%	0%		20%	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0%	33.3%	0%		0.3%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	0	1	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

Peak Hour: 01:30 PM - 02:30 PM Weather: Clear Sky (20.39 °C)



Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (1 . WELLINGTON RD 19 & 3 LINE)

Start Time	N Approach THIRD LINE						E Approach WELLINGTON COUNTY RD 19						S Approach THIRD LINE						W Approach WELLINGTON COUNTY RD 19						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	0	0	0	30	0	0	0	30	2	0	1	0	0	3	1	30	0	0	0	31	64	
07:15:00	0	0	0	0	0	0	0	29	0	0	0	29	1	0	2	0	0	3	3	25	0	0	0	28	60	
07:30:00	0	0	0	0	0	0	0	31	0	0	0	31	0	0	3	0	0	3	4	27	0	0	0	31	65	
07:45:00	0	0	0	0	0	0	0	45	1	0	0	46	2	0	2	0	0	4	4	40	1	0	0	45	95	284
08:00:00	0	0	0	0	0	0	0	35	3	0	0	38	1	1	18	0	0	20	10	23	0	0	0	33	91	311
08:15:00	1	0	0	0	0	1	0	42	1	0	0	43	2	0	8	0	0	10	9	30	0	0	0	39	93	344
08:30:00	1	0	0	0	0	1	0	41	1	0	0	42	1	0	7	0	0	8	9	39	1	0	0	49	100	379
08:45:00	0	0	0	0	0	0	0	48	0	0	0	48	2	0	12	0	0	14	5	25	1	0	0	31	93	377
BREAK																										
16:00:00	1	0	0	0	0	1	0	50	0	0	0	50	0	0	13	0	0	13	17	52	0	0	0	69	133	
16:15:00	1	0	1	0	0	2	0	51	2	0	0	53	2	0	14	0	0	16	8	38	4	0	0	50	121	
16:30:00	1	0	0	0	0	1	0	48	1	0	0	49	1	0	11	0	0	12	14	64	0	0	0	78	140	
16:45:00	0	0	0	0	0	0	0	53	0	0	0	53	1	0	10	0	0	11	9	58	1	0	0	68	132	526
17:00:00	1	0	0	0	0	1	0	62	0	0	0	62	1	0	4	0	0	5	9	58	1	0	0	68	136	529
17:15:00	0	0	0	0	0	0	0	42	0	0	0	42	0	0	2	0	0	2	7	48	2	0	0	57	101	509
17:30:00	1	0	0	0	0	1	0	44	1	0	0	45	0	0	4	0	0	4	5	46	0	0	0	51	101	470
17:45:00	0	0	0	0	0	0	0	27	0	0	0	27	2	0	4	0	0	6	0	42	0	0	0	42	75	413
Grand Total	7	0	1	0	0	8	0	678	10	0	0	688	18	1	115	0	0	134	114	645	11	0	0	770	**1600**	-
Approach%	87.5%	0%	12.5%	0%		-	0%	98.5%	1.5%	0%		-	13.4%	0.7%	85.8%	0%		-	14.8%	83.8%	1.4%	0%		-	-	-
Totals %	0.4%	0%	0.1%	0%		0.5%	0%	42.4%	0.6%	0%		43%	1.1%	0.1%	7.2%	0%		8.4%	7.1%	40.3%	0.7%	0%		48.1%	-	-
Heavy	0	0	0	0		-	0	27	1	0		-	2	0	0	0		-	2	28	0	0		-	-	-
Heavy %	0%	0%	0%	0%		-	0%	4%	10%	0%		-	11.1%	0%	0%	0%		-	1.8%	4.3%	0%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Peak Hour: 07:45 AM - 08:45 AM **Weather: Clear Sky (19.12 °C)**

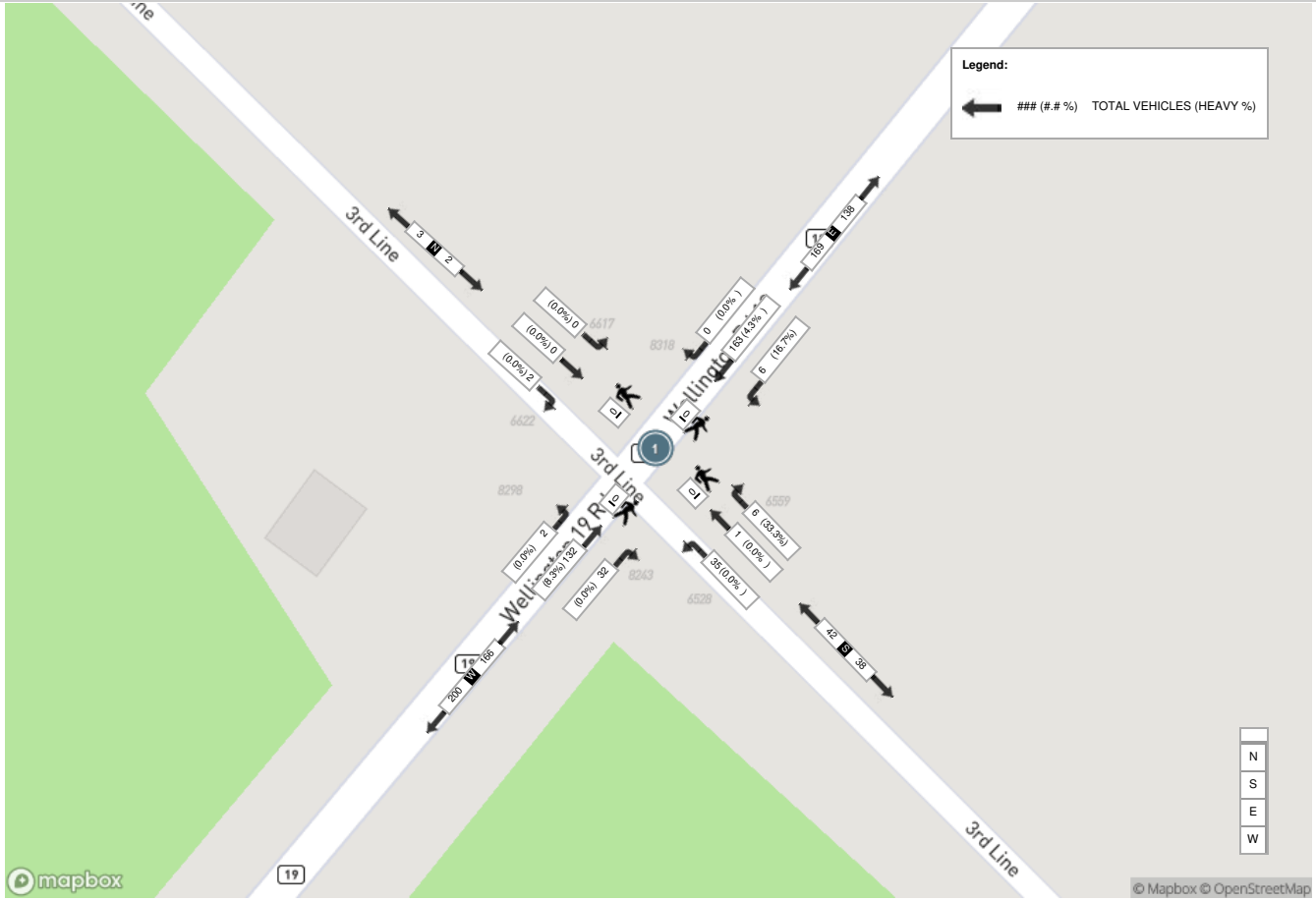
Start Time	N Approach THIRD LINE						E Approach WELLINGTON COUNTY RD 19						S Approach THIRD LINE						W Approach WELLINGTON COUNTY RD 19						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:45:00	0	0	0	0	0	0	0	45	1	0	0	46	2	0	2	0	0	4	4	40	1	0	0	45	95
08:00:00	0	0	0	0	0	0	0	35	3	0	0	38	1	1	18	0	0	20	10	23	0	0	0	33	91
08:15:00	1	0	0	0	0	1	0	42	1	0	0	43	2	0	8	0	0	10	9	30	0	0	0	39	93
08:30:00	1	0	0	0	0	1	0	41	1	0	0	42	1	0	7	0	0	8	9	39	1	0	0	49	100
Grand Total	2	0	0	0	0	2	0	163	6	0	0	169	6	1	35	0	0	42	32	132	2	0	0	166	**379**
Approach%	100%	0%	0%	0%		-	0%	96.4%	3.6%	0%		-	14.3%	2.4%	83.3%	0%		-	19.3%	79.5%	1.2%	0%		-	**-**
Totals %	0.5%	0%	0%	0%		0.5%	0%	43%	1.6%	0%		44.6%	1.6%	0.3%	9.2%	0%		11.1%	8.4%	34.8%	0.5%	0%		43.8%	**-**
PHF	0.5	0	0	0		0.5	0	0.91	0.5	0		0.92	0.75	0.25	0.49	0		0.53	0.8	0.83	0.5	0		0.85	**-**
Heavy	0	0	0	0		0	0	7	1	0		8	2	0	0	0		2	0	11	0	0		11	**-**
Heavy %	0%	0%	0%	0%		0%	0%	4.3%	16.7%	0%		4.7%	33.3%	0%	0%	0%		4.8%	0%	8.3%	0%	0%		6.6%	**-**
Lights	2	0	0	0		2	0	156	5	0		161	4	1	35	0		40	32	121	2	0		155	**-**
Lights %	100%	0%	0%	0%		100%	0%	95.7%	83.3%	0%		95.3%	66.7%	100%	100%	0%		95.2%	100%	91.7%	100%	0%		93.4%	**-**
Single-Unit Trucks	0	0	0	0		0	0	7	1	0		8	2	0	0	0		2	0	6	0	0		6	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	4.3%	16.7%	0%		4.7%	33.3%	0%	0%	0%		4.8%	0%	4.5%	0%	0%		3.6%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	5	0	0		5	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	3.8%	0%	0%		3%	**-**

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

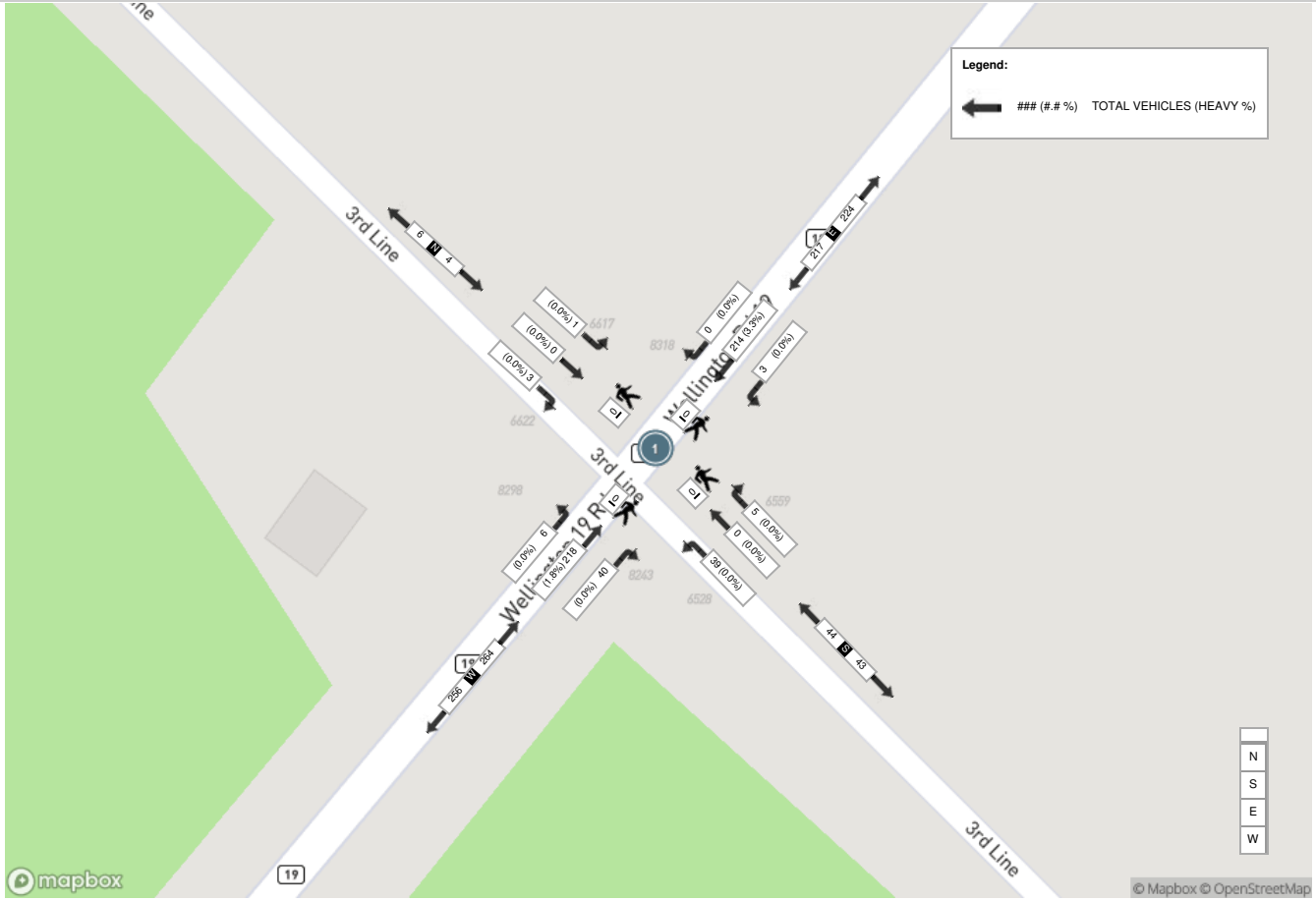
Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.71 °C)

Start Time	N Approach THIRD LINE						E Approach WELLINGTON COUNTY RD 19						S Approach THIRD LINE						W Approach WELLINGTON COUNTY RD 19						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	1	0	1	0	0	2	0	51	2	0	0	53	2	0	14	0	0	16	8	38	4	0	0	50	121
16:30:00	1	0	0	0	0	1	0	48	1	0	0	49	1	0	11	0	0	12	14	64	0	0	0	78	140
16:45:00	0	0	0	0	0	0	0	53	0	0	0	53	1	0	10	0	0	11	9	58	1	0	0	68	132
17:00:00	1	0	0	0	0	1	0	62	0	0	0	62	1	0	4	0	0	5	9	58	1	0	0	68	136
Grand Total	3	0	1	0	0	4	0	214	3	0	0	217	5	0	39	0	0	44	40	218	6	0	0	264	**529**
Approach%	75%	0%	25%	0%		-	0%	98.6%	1.4%	0%		-	11.4%	0%	88.6%	0%		-	15.2%	82.6%	2.3%	0%		-	**-**
Totals %	0.6%	0%	0.2%	0%		0.8%	0%	40.5%	0.6%	0%		41%	0.9%	0%	7.4%	0%		8.3%	7.6%	41.2%	1.1%	0%		49.9%	**-**
PHF	0.75	0	0.25	0		0.5	0	0.86	0.38	0		0.88	0.63	0	0.7	0		0.69	0.71	0.85	0.38	0		0.85	**-**
Heavy	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	4	0	0		4	**-**
Heavy %	0%	0%	0%	0%		0%	0%	3.3%	0%	0%		3.2%	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.5%	**-**
Lights	3	0	1	0		4	0	207	3	0		210	5	0	39	0		44	40	214	6	0		260	**-**
Lights %	100%	0%	100%	0%		100%	0%	96.7%	100%	0%		96.8%	100%	0%	100%	0%		100%	100%	98.2%	100%	0%		98.5%	**-**
Single-Unit Trucks	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	3	0	0		3	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	2.3%	0%	0%		2.3%	0%	0%	0%	0%		0%	0%	1.4%	0%	0%		1.1%	**-**
Articulated Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	1	0	0		1	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.4%	**-**

Peak Hour: 07:45 AM - 08:45 AM **Weather: Clear Sky (19.12 °C)**



Peak Hour: 04:15 PM - 05:15 PM **Weather: Broken Clouds (24.71 °C)**



Appendix D
Synchro Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	140	35	5	180	0	35	0	5	0	0	0
Future Volume (Veh/h)	0	140	35	5	180	0	35	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	152	38	5	196	0	38	0	5	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	196			190			358	358	152	363	396	196
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196			190			358	358	152	363	396	196
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			94	100	99	100	100	100
cM capacity (veh/h)	1377			1384			596	566	894	588	539	845

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	152	38	201	43	0
Volume Left	0	0	5	38	0
Volume Right	0	38	0	5	0
cSH	1377	1700	1384	620	1700
Volume to Capacity	0.00	0.02	0.00	0.07	0.00
Queue Length 95th (m)	0.0	0.0	0.1	1.8	0.0
Control Delay (s)	0.0	0.0	0.2	11.2	0.0
Lane LOS			A	B	A
Approach Delay (s)	0.0		0.2	11.2	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay	1.2				
Intersection Capacity Utilization	23.5%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	120	5	60	150	5	5	40	50	5	20	10
Future Volume (Veh/h)	10	120	5	60	150	5	5	40	50	5	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	130	5	65	163	5	5	43	54	5	22	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	168			135			467	450	130	520	450	163
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168			135			467	450	130	520	450	163
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			99	91	94	99	95	99
cM capacity (veh/h)	1422			1462			466	481	925	396	481	887

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	141	5	228	5	102	38
Volume Left	11	0	65	0	5	5
Volume Right	0	5	0	5	54	11
cSH	1422	1700	1462	1700	644	537
Volume to Capacity	0.01	0.00	0.04	0.00	0.16	0.07
Queue Length 95th (m)	0.2	0.0	1.1	0.0	4.5	1.8
Control Delay (s)	0.6	0.0	2.4	0.0	11.6	12.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.6		2.4		11.6	12.2
Approach LOS					B	B

Intersection Summary					
Average Delay	4.4				
Intersection Capacity Utilization	30.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	255	40	5	245	0	40	0	5	0	0	5
Future Volume (Veh/h)	5	255	40	5	245	0	40	0	5	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	277	43	5	266	0	43	0	5	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	266			320			568	563	277	568	606	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			320			568	563	277	568	606	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	99	100	100	99
cM capacity (veh/h)	1298			1240			428	432	762	428	408	773

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	282	43	271	48	5
Volume Left	5	0	5	43	0
Volume Right	0	43	0	5	5
cSH	1298	1700	1240	449	773
Volume to Capacity	0.00	0.03	0.00	0.11	0.01
Queue Length 95th (m)	0.1	0.0	0.1	2.9	0.2
Control Delay (s)	0.2	0.0	0.2	14.0	9.7
Lane LOS	A		A	B	A
Approach Delay (s)	0.2		0.2	14.0	9.7
Approach LOS				B	A

Intersection Summary					
Average Delay	1.3				
Intersection Capacity Utilization	32.8%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	210	10	65	210	15	15	45	85	5	25	20
Future Volume (Veh/h)	20	210	10	65	210	15	15	45	85	5	25	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	228	11	71	228	16	16	49	92	5	27	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	244			239			678	658	228	758	653	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	244			239			678	658	228	758	653	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			95	86	89	98	92	97
cM capacity (veh/h)	1322			1328			318	358	811	243	360	811

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	250	11	299	16	157	54
Volume Left	22	0	71	0	16	5
Volume Right	0	11	0	16	92	22
cSH	1322	1700	1328	1700	522	440
Volume to Capacity	0.02	0.01	0.05	0.01	0.30	0.12
Queue Length 95th (m)	0.4	0.0	1.4	0.0	10.0	3.3
Control Delay (s)	0.8	0.0	2.2	0.0	14.8	14.3
Lane LOS	A		A		B	B
Approach Delay (s)	0.8		2.1		14.8	14.3
Approach LOS					B	B

Intersection Summary					
Average Delay	5.1				
Intersection Capacity Utilization	48.0%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	330	35	15	285	0	25	0	15	0	0	5
Future Volume (Veh/h)	5	330	35	15	285	0	25	0	15	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	359	38	16	310	0	27	0	16	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	310			397			716	711	359	727	749	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310			397			716	711	359	727	749	310
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			92	100	98	100	100	99
cM capacity (veh/h)	1250			1162			338	352	685	327	334	730

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	364	38	326	43	5
Volume Left	5	0	16	27	0
Volume Right	0	38	0	16	5
cSH	1250	1700	1162	417	730
Volume to Capacity	0.00	0.02	0.01	0.10	0.01
Queue Length 95th (m)	0.1	0.0	0.3	2.7	0.2
Control Delay (s)	0.1	0.0	0.5	14.6	10.0
Lane LOS	A		A	B	A
Approach Delay (s)	0.1		0.5	14.6	10.0
Approach LOS				B	A

Intersection Summary					
Average Delay	1.2				
Intersection Capacity Utilization	42.9%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	265	10	75	230	10	10	30	95	10	25	10
Future Volume (Veh/h)	10	265	10	75	230	10	10	30	95	10	25	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	288	11	82	250	11	11	33	103	11	27	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	261			299			748	735	288	844	735	250
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261			299			748	735	288	844	735	250
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			96	90	86	95	92	99
cM capacity (veh/h)	1303			1262			286	322	751	213	322	789

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	299	11	332	11	147	49
Volume Left	11	0	82	0	11	11
Volume Right	0	11	0	11	103	11
cSH	1303	1700	1262	1700	528	328
Volume to Capacity	0.01	0.01	0.06	0.01	0.28	0.15
Queue Length 95th (m)	0.2	0.0	1.7	0.0	9.0	4.2
Control Delay (s)	0.4	0.0	2.5	0.0	14.4	17.9
Lane LOS	A		A		B	C
Approach Delay (s)	0.3		2.4		14.4	17.9
Approach LOS					B	C

Intersection Summary					
Average Delay	4.6				
Intersection Capacity Utilization	49.4%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	160	35	5	205	0	35	0	5	0	0	0
Future Volume (Veh/h)	0	160	35	5	205	0	35	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	174	38	5	223	0	38	0	5	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	223			212			407	407	174	412	445	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	223			212			407	407	174	412	445	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	99	100	100	100
cM capacity (veh/h)	1346			1358			553	531	869	546	506	817

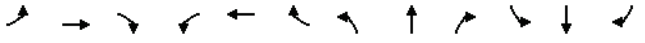
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	174	38	228	43	0
Volume Left	0	0	5	38	0
Volume Right	0	38	0	5	0
cSH	1346	1700	1358	577	1700
Volume to Capacity	0.00	0.02	0.00	0.07	0.00
Queue Length 95th (m)	0.0	0.0	0.1	1.9	0.0
Control Delay (s)	0.0	0.0	0.2	11.7	0.0
Lane LOS			A	B	A
Approach Delay (s)	0.0		0.2	11.7	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay	1.1				
Intersection Capacity Utilization	24.8%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	140	5	60	175	5	5	40	50	5	20	10
Future Volume (Veh/h)	10	140	5	60	175	5	5	40	50	5	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	152	5	65	190	5	5	43	54	5	22	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	195			157			516	499	152	570	499	190
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195			157			516	499	152	570	499	190
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			99	90	94	99	95	99
cM capacity (veh/h)	1390			1435			431	451	900	365	451	857

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	163	5	255	5	102	38
Volume Left	11	0	65	0	5	5
Volume Right	0	5	0	5	54	11
cSH	1390	1700	1435	1700	611	504
Volume to Capacity	0.01	0.00	0.05	0.00	0.17	0.08
Queue Length 95th (m)	0.2	0.0	1.1	0.0	4.8	1.9
Control Delay (s)	0.6	0.0	2.2	0.0	12.1	12.7
Lane LOS	A		A		B	B
Approach Delay (s)	0.6		2.2		12.1	12.7
Approach LOS					B	B

Intersection Summary					
Average Delay	4.2				
Intersection Capacity Utilization	36.5%	ICU Level of Service	A		
Analysis Period (min)	15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	295	40	5	280	0	40	0	5	0	0	5
Future Volume (Veh/h)	5	295	40	5	280	0	40	0	5	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	321	43	5	304	0	43	0	5	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304			364			650	645	321	650	688	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			364			650	645	321	650	688	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			89	100	99	100	100	99
cM capacity (veh/h)	1257			1195			377	388	720	377	366	736

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	326	43	309	48	5
Volume Left	5	0	5	43	0
Volume Right	0	43	0	5	5
cSH	1257	1700	1195	397	736
Volume to Capacity	0.00	0.03	0.00	0.12	0.01
Queue Length 95th (m)	0.1	0.0	0.1	3.3	0.2
Control Delay (s)	0.2	0.0	0.2	15.3	9.9
Lane LOS	A		A	C	A
Approach Delay (s)	0.1		0.2	15.3	9.9
Approach LOS				C	A

Intersection Summary					
Average Delay	1.2				
Intersection Capacity Utilization	34.6%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	250	10	65	245	15	15	45	85	5	25	20
Future Volume (Veh/h)	20	250	10	65	245	15	15	45	85	5	25	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	272	11	71	266	16	16	49	92	5	27	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	282			283			760	740	272	840	735	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282			283			760	740	272	840	735	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			94	85	88	98	92	97
cM capacity (veh/h)	1280			1279			278	320	767	209	322	773

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	294	11	337	16	157	54
Volume Left	22	0	71	0	16	5
Volume Right	0	11	0	16	92	22
cSH	1280	1700	1279	1700	475	396
Volume to Capacity	0.02	0.01	0.06	0.01	0.33	0.14
Queue Length 95th (m)	0.4	0.0	1.4	0.0	11.5	3.7
Control Delay (s)	0.7	0.0	2.1	0.0	16.3	15.5
Lane LOS	A		A		C	C
Approach Delay (s)	0.7		2.0		16.3	15.5
Approach LOS					C	C

Intersection Summary					
Average Delay	5.0				
Intersection Capacity Utilization	52.0%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	380	35	15	325	0	25	0	15	0	0	5
Future Volume (Veh/h)	5	380	35	15	325	0	25	0	15	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	413	38	16	353	0	27	0	16	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	353			451			813	808	413	824	846	353
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			451			813	808	413	824	846	353
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			91	100	97	100	100	99
cM capacity (veh/h)	1206			1109			291	309	639	281	294	691

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	418	38	369	43	5
Volume Left	5	0	16	27	0
Volume Right	0	38	0	16	5
cSH	1206	1700	1109	365	691
Volume to Capacity	0.00	0.02	0.01	0.12	0.01
Queue Length 95th (m)	0.1	0.0	0.4	3.2	0.2
Control Delay (s)	0.1	0.0	0.5	16.2	10.3
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		0.5	16.2	10.3
Approach LOS				C	B

Intersection Summary					
Average Delay	1.1				
Intersection Capacity Utilization	44.9%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	315	10	75	270	10	10	30	95	10	25	10
Future Volume (Veh/h)	10	315	10	75	270	10	10	30	95	10	25	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	342	11	82	293	11	11	33	103	11	27	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304			353			846	832	342	940	832	293
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			353			846	832	342	940	832	293
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			95	88	85	94	90	99
cM capacity (veh/h)	1257			1206			243	282	701	178	282	746

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	353	11	375	11	147	49
Volume Left	11	0	82	0	11	11
Volume Right	0	11	0	11	103	11
cSH	1257	1700	1206	1700	475	284
Volume to Capacity	0.01	0.01	0.07	0.01	0.31	0.17
Queue Length 95th (m)	0.2	0.0	1.7	0.0	10.4	4.9
Control Delay (s)	0.3	0.0	2.3	0.0	15.9	20.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		2.3		15.9	20.3
Approach LOS					C	C

Intersection Summary					
Average Delay	4.6				
Intersection Capacity Utilization	54.1%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	195	40	25	240	15	140	0	60	5	0	5
Future Volume (Veh/h)	10	195	40	25	240	15	140	0	60	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	212	43	27	261	16	152	0	65	5	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	277			255			576	586	234	622	600	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			255			576	586	234	622	600	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			64	100	92	99	100	99
cM capacity (veh/h)	1286			1310			416	410	806	359	403	770

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	7	259	18	286	217	10
Volume Left	7	4	18	9	152	5
Volume Right	0	43	0	16	65	5
cSH	1286	1286	1310	1310	487	489
Volume to Capacity	0.01	0.01	0.02	0.02	0.45	0.02
Queue Length 95th (m)	0.2	0.2	0.5	0.5	18.1	0.5
Control Delay (s)	7.8	0.2	7.8	0.4	18.2	12.5
Lane LOS	A	A	A	A	C	B
Approach Delay (s)	0.4		0.9		18.2	12.5
Approach LOS					C	B

Intersection Summary					
Average Delay	5.6				
Intersection Capacity Utilization	40.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	165	5	110	245	30	5	40	70	10	20	10
Future Volume (Veh/h)	10	165	5	110	245	30	5	40	70	10	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	179	5	120	266	33	5	43	76	11	22	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	299			184			729	740	179	804	712	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	299			184			729	740	179	804	712	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			91			98	86	91	95	93	99
cM capacity (veh/h)	1274			1403			296	315	869	231	326	778

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	190	5	386	33	124	44
Volume Left	11	0	120	0	5	11
Volume Right	0	5	0	33	76	11
cSH	1274	1700	1403	1700	515	340
Volume to Capacity	0.01	0.00	0.09	0.02	0.24	0.13
Queue Length 95th (m)	0.2	0.0	2.2	0.0	7.5	3.5
Control Delay (s)	0.5	0.0	3.0	0.0	14.2	17.1
Lane LOS	A		A		B	C
Approach Delay (s)	0.5		2.7		14.2	17.1
Approach LOS					B	C

Intersection Summary					
Average Delay	4.8				
Intersection Capacity Utilization	45.1%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	60	55	5
Future Volume (Veh/h)	15	10	5	60	55	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	11	5	65	60	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	138	62	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138	62	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	853	1002	1537			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	70	65
Volume Left	16	5	0
Volume Right	11	0	5
cSH	908	1537	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.7	0.1	0.0
Control Delay (s)	9.1	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	0.5	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.8		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	220	40	20	240	0	40	0	35	0	0	0
Future Volume (Veh/h)	0	220	40	20	240	0	40	0	35	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	239	43	22	261	0	43	0	38	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	261			282			544	544	239	582	587	261
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261			282			544	544	239	582	587	261
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	95	100	100	100
cM capacity (veh/h)	1303			1280			444	439	800	399	415	778

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	239	43	283	81	0
Volume Left	0	0	22	43	0
Volume Right	0	43	0	38	0
cSH	1303	1700	1280	561	1700
Volume to Capacity	0.00	0.03	0.02	0.14	0.00
Queue Length 95th (m)	0.0	0.0	0.4	4.0	0.0
Control Delay (s)	0.0	0.0	0.8	12.5	0.0
Lane LOS			A	B	A
Approach Delay (s)	0.0		0.8	12.5	0.0
Approach LOS				B	A

Intersection Summary				
Average Delay		1.9		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	330	10	105	295	25	15	45	145	20	25	20
Future Volume (Veh/h)	20	330	10	105	295	25	15	45	145	20	25	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	359	11	114	321	27	16	49	158	22	27	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	348			370			988	979	359	1134	963	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			370			988	979	359	1134	963	321
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			90			91	78	77	79	88	97
cM capacity (veh/h)	1211			1189			183	222	685	105	227	720

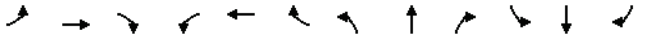
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	381	11	435	27	223	71
Volume Left	22	0	114	0	16	22
Volume Right	0	11	0	27	158	22
cSH	1211	1700	1189	1700	414	198
Volume to Capacity	0.02	0.01	0.10	0.02	0.54	0.36
Queue Length 95th (m)	0.4	0.0	2.5	0.0	24.8	12.2
Control Delay (s)	0.6	0.0	2.9	0.0	23.4	33.0
Lane LOS	A		A		C	D
Approach Delay (s)	0.6		2.7		23.4	33.0
Approach LOS					C	D

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	0	50	55	10
Future Volume (Veh/h)	15	10	0	50	55	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	11	0	54	60	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	120	66	71			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	120	66	71			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	876	998	1529			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	54	71
Volume Left	16	0	0
Volume Right	11	0	11
cSH	922	1529	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	9.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	13.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	345	45	45	360	0	50	0	30	0	0	5
Future Volume (Veh/h)	5	345	45	45	360	0	50	0	30	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	375	49	49	391	0	54	0	33	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	391			424			879	874	375	907	923	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			424			879	874	375	907	923	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			79	100	95	100	100	99
cM capacity (veh/h)	1168			1135			256	275	671	235	257	658

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	380	49	440	87	5
Volume Left	5	0	49	54	0
Volume Right	0	49	0	33	5
cSH	1168	1700	1135	335	658
Volume to Capacity	0.00	0.03	0.04	0.26	0.01
Queue Length 95th (m)	0.1	0.0	1.1	8.2	0.2
Control Delay (s)	0.2	0.0	1.3	19.5	10.5
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		1.3	19.5	10.5
Approach LOS				C	B

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	61.1%	ICU Level of Service	B		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	340	140	75	325	15	85	0	45	10	0	15
Future Volume (Veh/h)	15	340	140	75	325	15	85	0	45	10	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	370	152	82	353	16	92	0	49	11	0	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	369			522			1011	1011	446	976	1079	361
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	369			522			1011	1011	446	976	1079	361
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			54	100	92	94	100	98
cM capacity (veh/h)	1190			1044			198	218	612	197	199	684

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	527	55	396	141	27
Volume Left	11	5	55	27	92	11
Volume Right	0	152	0	16	49	16
cSH	1190	1190	1044	1044	259	341
Volume to Capacity	0.01	0.01	0.08	0.08	0.54	0.08
Queue Length 95th (m)	0.3	0.3	2.0	2.0	23.8	2.1
Control Delay (s)	8.1	0.2	8.7	1.4	34.3	16.5
Lane LOS	A	A	A	A	D	C
Approach Delay (s)	0.4		2.3		34.3	16.5
Approach LOS					D	C

Intersection Summary					
Average Delay	5.6				
Intersection Capacity Utilization	58.1%	ICU Level of Service	B		
Analysis Period (min)	15				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	5	15	65	55	25
Future Volume (Veh/h)	15	5	15	65	55	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	5	16	71	60	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	176	74	87			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	176	74	87			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	805	988	1509			

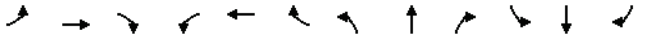
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	87	87
Volume Left	16	16	0
Volume Right	5	0	27
cSH	842	1509	1700
Volume to Capacity	0.02	0.01	0.05
Queue Length 95th (m)	0.6	0.3	0.0
Control Delay (s)	9.4	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.4	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization	20.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	5	10	70	75	15
Future Volume (Veh/h)	10	5	10	70	75	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	5	11	76	82	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	188	90	98			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	188	90	98			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	795	968	1495			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	87	98
Volume Left	11	11	0
Volume Right	5	0	16
cSH	842	1495	1700
Volume to Capacity	0.02	0.01	0.06
Queue Length 95th (m)	0.5	0.2	0.0
Control Delay (s)	9.4	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization	20.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	420	120	60	355	10	85	0	60	15	0	15
Future Volume (Veh/h)	15	420	120	60	355	10	85	0	60	15	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	457	130	65	386	11	92	0	65	16	0	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	397			587			1086	1081	522	1076	1140	392
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	397			587			1086	1081	522	1076	1140	392
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			48	100	88	90	100	98
cM capacity (veh/h)	1162			988			178	201	555	164	185	657

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	592	43	419	157	32
Volume Left	11	5	43	22	92	16
Volume Right	0	130	0	11	65	16
cSH	1162	1162	988	988	247	262
Volume to Capacity	0.01	0.01	0.07	0.07	0.63	0.12
Queue Length 95th (m)	0.3	0.3	1.7	1.7	31.0	3.3
Control Delay (s)	8.1	0.2	8.9	1.2	41.8	20.7
Lane LOS	A	A	A	A	E	C
Approach Delay (s)	0.4		1.9		41.8	20.7
Approach LOS					E	C

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	53.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	400	10	110	330	20	10	30	135	20	25	10
Future Volume (Veh/h)	10	400	10	110	330	20	10	30	135	20	25	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	435	11	120	359	22	11	33	147	22	27	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	381			446			1080	1078	435	1220	1067	359
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	381			446			1080	1078	435	1220	1067	359
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			89			93	83	76	77	86	98
cM capacity (veh/h)	1177			1114			157	193	621	95	196	685

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	446	11	479	22	191	60
Volume Left	11	0	120	0	11	22
Volume Right	0	11	0	22	147	11
cSH	1177	1700	1114	1700	400	156
Volume to Capacity	0.01	0.01	0.11	0.01	0.48	0.38
Queue Length 95th (m)	0.2	0.0	2.9	0.0	20.0	13.2
Control Delay (s)	0.3	0.0	3.0	0.0	21.9	41.9
Lane LOS	A		A		C	E
Approach Delay (s)	0.3		2.9		21.9	41.9
Approach LOS					C	E

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	5	5	60	70	15
Future Volume (Veh/h)	10	5	5	60	70	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	5	5	65	76	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	159	84	92			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159	84	92			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	829	975	1503			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	70	92
Volume Left	11	5	0
Volume Right	5	0	16
cSH	870	1503	1700
Volume to Capacity	0.02	0.00	0.05
Queue Length 95th (m)	0.4	0.1	0.0
Control Delay (s)	9.2	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.6	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	450	40	45	395	0	25	0	45	0	0	5
Future Volume (Veh/h)	5	450	40	45	395	0	25	0	45	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	489	43	49	429	0	27	0	49	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	429			532			1031	1026	489	1075	1069	429
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	429			532			1031	1026	489	1075	1069	429
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			87	100	92	100	100	99
cM capacity (veh/h)	1130			1036			201	223	579	173	210	626

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	494	43	478	76	5
Volume Left	5	0	49	27	0
Volume Right	0	43	0	49	5
cSH	1130	1700	1036	348	626
Volume to Capacity	0.00	0.03	0.05	0.22	0.01
Queue Length 95th (m)	0.1	0.0	1.2	6.6	0.2
Control Delay (s)	0.1	0.0	1.4	18.2	10.8
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		1.4	18.2	10.8
Approach LOS				C	B

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	160	5	60	200	5	5	40	50	5	20	10
Future Volume (Veh/h)	10	160	5	60	200	5	5	40	50	5	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	174	5	65	217	5	5	43	54	5	22	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	222			179			565	548	174	618	548	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			179			565	548	174	618	548	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			99	90	94	99	95	99
cM capacity (veh/h)	1359			1409			399	423	875	336	423	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	185	5	282	5	102	38
Volume Left	11	0	65	0	5	5
Volume Right	0	5	0	5	54	11
cSH	1359	1700	1409	1700	580	474
Volume to Capacity	0.01	0.00	0.05	0.00	0.18	0.08
Queue Length 95th (m)	0.2	0.0	1.2	0.0	5.1	2.1
Control Delay (s)	0.5	0.0	2.1	0.0	12.5	13.3
Lane LOS	A		A		B	B
Approach Delay (s)	0.5		2.0		12.5	13.3
Approach LOS					B	B

Intersection Summary					
Average Delay	4.0				
Intersection Capacity Utilization	38.8%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	10	5	45	60	15
Future Volume (Veh/h)	20	10	5	45	60	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	5	49	65	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	132	73	81			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132	73	81			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	100			
cM capacity (veh/h)	859	989	1517			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	33	54	81
Volume Left	22	5	0
Volume Right	11	0	16
cSH	898	1517	1700
Volume to Capacity	0.04	0.00	0.05
Queue Length 95th (m)	0.9	0.1	0.0
Control Delay (s)	9.2	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.7	0.0
Approach LOS	A		

Intersection Summary					
Average Delay	2.0				
Intersection Capacity Utilization	16.5%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	280	10	65	275	15	15	45	85	5	25	20
Future Volume (Veh/h)	20	280	10	65	275	15	15	45	85	5	25	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	304	11	71	299	16	16	49	92	5	27	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	315			315			824	805	304	906	800	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			315			824	805	304	906	800	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			94	83	87	97	91	97
cM capacity (veh/h)	1245			1245			249	293	736	185	295	741

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	326	11	370	16	157	54
Volume Left	22	0	71	0	16	5
Volume Right	0	11	0	16	92	22
cSH	1245	1700	1245	1700	440	364
Volume to Capacity	0.02	0.01	0.06	0.01	0.36	0.15
Queue Length 95th (m)	0.4	0.0	1.4	0.0	12.7	4.1
Control Delay (s)	0.7	0.0	2.0	0.0	17.6	16.6
Lane LOS	A		A		C	C
Approach Delay (s)	0.7		1.9		17.6	16.6
Approach LOS					C	C

Intersection Summary					
Average Delay	5.0				
Intersection Capacity Utilization	55.1%	ICU Level of Service	B		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	180	35	5	230	0	35	0	5	0	0	0
Future Volume (Veh/h)	0	180	35	5	230	0	35	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	196	38	5	250	0	38	0	5	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	250			234			456	456	196	461	494	250
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250			234			456	456	196	461	494	250
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	99	100	100	100
cM capacity (veh/h)	1316			1333			513	499	845	506	475	789

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	196	38	255	43	0
Volume Left	0	0	5	38	0
Volume Right	0	38	0	5	0
cSH	1316	1700	1333	538	1700
Volume to Capacity	0.00	0.02	0.00	0.08	0.00
Queue Length 95th (m)	0.0	0.0	0.1	2.1	0.0
Control Delay (s)	0.0	0.0	0.2	12.3	0.0
Lane LOS			A	B	A
Approach Delay (s)	0.0		0.2	12.3	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay	1.1				
Intersection Capacity Utilization	26.1%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	355	10	75	305	10	10	30	95	10	25	10
Future Volume (Veh/h)	10	355	10	75	305	10	10	30	95	10	25	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	386	11	82	332	11	11	33	103	11	27	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	343			397			928	915	386	1024	915	332
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343			397			928	915	386	1024	915	332
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			95	87	84	93	89	98
cM capacity (veh/h)	1216			1162			211	251	662	153	251	710

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	397	11	414	11	147	49
Volume Left	11	0	82	0	11	11
Volume Right	0	11	0	11	103	11
cSH	1216	1700	1162	1700	433	251
Volume to Capacity	0.01	0.01	0.07	0.01	0.34	0.20
Queue Length 95th (m)	0.2	0.0	1.8	0.0	11.8	5.7
Control Delay (s)	0.3	0.0	2.2	0.0	17.5	22.8
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		2.2		17.5	22.8
Approach LOS					C	C

Intersection Summary					
Average Delay	4.6				
Intersection Capacity Utilization	58.1%	ICU Level of Service	B		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	325	40	5	310	0	40	0	5	0	0	5
Future Volume (Veh/h)	5	325	40	5	310	0	40	0	5	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	353	43	5	337	0	43	0	5	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	337			396			715	710	353	715	753	337
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	337			396			715	710	353	715	753	337
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			87	100	99	100	100	99
cM capacity (veh/h)	1222			1163			341	356	691	341	336	705

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	358	43	342	48	5
Volume Left	5	0	5	43	0
Volume Right	0	43	0	5	5
cSH	1222	1700	1163	360	705
Volume to Capacity	0.00	0.03	0.00	0.13	0.01
Queue Length 95th (m)	0.1	0.0	0.1	3.6	0.2
Control Delay (s)	0.2	0.0	0.2	16.5	10.1
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		0.2	16.5	10.1
Approach LOS				C	B

Intersection Summary					
Average Delay	1.2				
Intersection Capacity Utilization	36.2%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	185	5	110	270	30	5	40	70	10	20	10
Future Volume (Veh/h)	10	185	5	110	270	30	5	40	70	10	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	201	5	120	293	33	5	43	76	11	22	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	326			206			778	789	201	854	761	293
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	326			206			778	789	201	854	761	293
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			91			98	85	91	95	93	99
cM capacity (veh/h)	1245			1377			273	294	845	211	305	751

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	212	5	413	33	124	44
Volume Left	11	0	120	0	5	11
Volume Right	0	5	0	33	76	11
cSH	1245	1700	1377	1700	487	317
Volume to Capacity	0.01	0.00	0.09	0.02	0.25	0.14
Queue Length 95th (m)	0.2	0.0	2.3	0.0	8.0	3.8
Control Delay (s)	0.5	0.0	2.9	0.0	14.9	18.2
Lane LOS	A		A		B	C
Approach Delay (s)	0.5		2.7		14.9	18.2
Approach LOS					B	C

Intersection Summary					
Average Delay	4.7				
Intersection Capacity Utilization	47.5%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	420	35	15	360	0	25	0	15	0	0	5
Future Volume (Veh/h)	5	420	35	15	360	0	25	0	15	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	457	38	16	391	0	27	0	16	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	391			495			895	890	457	906	928	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			495			895	890	457	906	928	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			89	100	97	100	100	99
cM capacity (veh/h)	1168			1069			256	277	604	247	263	658

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	462	38	407	43	5
Volume Left	5	0	16	27	0
Volume Right	0	38	0	16	5
cSH	1168	1700	1069	325	658
Volume to Capacity	0.00	0.02	0.01	0.13	0.01
Queue Length 95th (m)	0.1	0.0	0.4	3.6	0.2
Control Delay (s)	0.1	0.0	0.5	17.7	10.5
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		0.5	17.7	10.5
Approach LOS				C	B

Intersection Summary					
Average Delay	1.1				
Intersection Capacity Utilization	46.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	240	40	20	265	0	40	0	35	0	0	0
Future Volume (Veh/h)	0	240	40	20	265	0	40	0	35	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	261	43	22	288	0	43	0	38	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	288			304			593	593	261	631	636	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	288			304			593	593	261	631	636	288
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	95	100	100	100
cM capacity (veh/h)	1274			1257			412	411	778	369	389	751

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	261	43	310	81	0
Volume Left	0	0	22	43	0
Volume Right	0	43	0	38	0
cSH	1274	1700	1257	528	1700
Volume to Capacity	0.00	0.03	0.02	0.15	0.00
Queue Length 95th (m)	0.0	0.0	0.4	4.3	0.0
Control Delay (s)	0.0	0.0	0.7	13.0	0.0
Lane LOS			A	B	A
Approach Delay (s)	0.0		0.7	13.0	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay	1.8				
Intersection Capacity Utilization	41.4%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	215	40	25	265	15	140	0	60	5	0	5
Future Volume (Veh/h)	10	215	40	25	265	15	140	0	60	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	234	43	27	288	16	152	0	65	5	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304			277			624	636	256	671	649	296
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			277			624	636	256	671	649	296
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			61	100	92	98	100	99
cM capacity (veh/h)	1257			1286			386	384	783	332	377	743

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	7	281	18	313	217	10
Volume Left	7	4	18	9	152	5
Volume Right	0	43	0	16	65	5
cSH	1257	1257	1286	1286	455	459
Volume to Capacity	0.01	0.01	0.02	0.02	0.48	0.02
Queue Length 95th (m)	0.2	0.2	0.5	0.5	20.2	0.5
Control Delay (s)	7.9	0.2	7.9	0.4	19.9	13.0
Lane LOS	A	A	A	A	C	B
Approach Delay (s)	0.4		0.8		19.9	13.0
Approach LOS					C	B

Intersection Summary					
Average Delay	5.7				
Intersection Capacity Utilization	41.1%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	0	50	55	10
Future Volume (Veh/h)	15	10	0	50	55	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	11	0	54	60	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	120	66	71			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	120	66	71			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	876	998	1529			

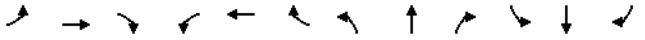
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	54	71
Volume Left	16	0	0
Volume Right	11	0	11
cSH	922	1529	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	9.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization		13.5%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	60	55	5
Future Volume (Veh/h)	15	10	5	60	55	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	11	5	65	60	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	138	62	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138	62	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	853	1002	1537			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	70	65
Volume Left	16	5	0
Volume Right	11	0	5
cSH	908	1537	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.7	0.1	0.0
Control Delay (s)	9.1	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	0.5	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.8		
Intersection Capacity Utilization		17.3%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	370	140	75	355	15	85	0	45	10	0	15
Future Volume (Veh/h)	15	370	140	75	355	15	85	0	45	10	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	402	152	82	386	16	92	0	49	11	0	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	402			554			1076	1076	478	1041	1144	394
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	402			554			1076	1076	478	1041	1144	394
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			48	100	92	94	100	98
cM capacity (veh/h)	1157			1016			178	199	587	177	181	655

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	559	55	429	141	27
Volume Left	11	5	55	27	92	11
Volume Right	0	152	0	16	49	16
cSH	1157	1157	1016	1016	235	312
Volume to Capacity	0.01	0.01	0.08	0.08	0.60	0.09
Queue Length 95th (m)	0.3	0.3	2.1	2.1	27.7	2.3
Control Delay (s)	8.2	0.2	8.9	1.4	40.8	17.6
Lane LOS	A	A	A	A	E	C
Approach Delay (s)	0.4		2.3		40.8	17.6
Approach LOS					E	C

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	360	10	105	325	25	15	45	145	20	25	20
Future Volume (Veh/h)	20	360	10	105	325	25	15	45	145	20	25	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	391	11	114	353	27	16	49	158	22	27	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	380			402			1052	1043	391	1198	1027	353
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380			402			1052	1043	391	1198	1027	353
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			90			90	76	76	76	87	97
cM capacity (veh/h)	1178			1157			163	203	658	92	207	691

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	413	11	467	27	223	71
Volume Left	22	0	114	0	16	22
Volume Right	0	11	0	27	158	22
cSH	1178	1700	1157	1700	384	177
Volume to Capacity	0.02	0.01	0.10	0.02	0.58	0.40
Queue Length 95th (m)	0.5	0.0	2.6	0.0	28.2	14.2
Control Delay (s)	0.6	0.0	2.9	0.0	26.5	38.4
Lane LOS	A		A		D	E
Approach Delay (s)	0.6		2.7		26.5	38.4
Approach LOS					D	E

Intersection Summary				
Average Delay	8.4			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	5	10	70	75	15
Future Volume (Veh/h)	10	5	10	70	75	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	5	11	76	82	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	188	90	98			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	188	90	98			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	795	968	1495			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	87	98
Volume Left	11	11	0
Volume Right	5	0	16
cSH	842	1495	1700
Volume to Capacity	0.02	0.01	0.06
Queue Length 95th (m)	0.5	0.2	0.0
Control Delay (s)	9.4	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization	20.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	375	45	45	390	0	50	0	30	0	0	5
Future Volume (Veh/h)	5	375	45	45	390	0	50	0	30	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	408	49	49	424	0	54	0	33	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	424			457			945	940	408	973	989	424
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424			457			945	940	408	973	989	424
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			77	100	95	100	100	99
cM capacity (veh/h)	1135			1104			231	251	643	211	235	630

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	413	49	473	87	5
Volume Left	5	0	49	54	0
Volume Right	0	49	0	33	5
cSH	1135	1700	1104	305	630
Volume to Capacity	0.00	0.03	0.04	0.29	0.01
Queue Length 95th (m)	0.1	0.0	1.1	9.2	0.2
Control Delay (s)	0.1	0.0	1.3	21.4	10.8
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		1.3	21.4	10.8
Approach LOS				C	B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	440	10	110	365	20	10	30	135	20	25	10
Future Volume (Veh/h)	10	440	10	110	365	20	10	30	135	20	25	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	478	11	120	397	22	11	33	147	22	27	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	419			489			1162	1159	478	1300	1148	397
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	419			489			1162	1159	478	1300	1148	397
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			89			92	81	75	73	85	98
cM capacity (veh/h)	1140			1074			136	172	587	80	175	652

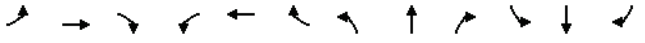
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	489	11	517	22	191	60
Volume Left	11	0	120	0	11	22
Volume Right	0	11	0	22	147	11
cSH	1140	1700	1074	1700	365	135
Volume to Capacity	0.01	0.01	0.11	0.01	0.52	0.44
Queue Length 95th (m)	0.2	0.0	3.0	0.0	23.2	15.9
Control Delay (s)	0.3	0.0	3.0	0.0	25.2	51.5
Lane LOS	A		A		D	F
Approach Delay (s)	0.3		2.9		25.2	51.5
Approach LOS					D	F

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	69.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	5	15	65	55	25
Future Volume (Veh/h)	15	5	15	65	55	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	5	16	71	60	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	176	74	87			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	176	74	87			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	805	988	1509			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	87	87
Volume Left	16	16	0
Volume Right	5	0	27
cSH	842	1509	1700
Volume to Capacity	0.02	0.01	0.05
Queue Length 95th (m)	0.6	0.3	0.0
Control Delay (s)	9.4	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.4	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	20.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	490	40	45	430	0	25	0	45	0	0	5
Future Volume (Veh/h)	5	490	40	45	430	0	25	0	45	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	533	43	49	467	0	27	0	49	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	467			576			1113	1108	533	1157	1151	467
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467			576			1113	1108	533	1157	1151	467
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			85	100	91	100	100	99
cM capacity (veh/h)	1094			997			177	199	547	151	187	596

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	538	43	516	76	5
Volume Left	5	0	49	27	0
Volume Right	0	43	0	49	5
cSH	1094	1700	997	313	596
Volume to Capacity	0.00	0.03	0.05	0.24	0.01
Queue Length 95th (m)	0.1	0.0	1.2	7.4	0.2
Control Delay (s)	0.1	0.0	1.4	20.1	11.1
Lane LOS	A		A	C	B
Approach Delay (s)	0.1		1.4	20.1	11.1
Approach LOS				C	B

Intersection Summary					
Average Delay	2.0				
Intersection Capacity Utilization	72.0%	ICU Level of Service	C		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	460	120	60	390	10	85	0	60	15	0	15
Future Volume (Veh/h)	15	460	120	60	390	10	85	0	60	15	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	500	130	65	424	11	92	0	65	16	0	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	435			630			1167	1162	565	1156	1222	430
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	435			630			1167	1162	565	1156	1222	430
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			41	100	88	89	100	97
cM capacity (veh/h)	1125			952			156	179	524	142	165	626

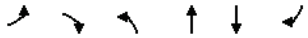
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	635	43	457	157	32
Volume Left	11	5	43	22	92	16
Volume Right	0	130	0	11	65	16
cSH	1125	1125	952	952	220	232
Volume to Capacity	0.01	0.01	0.07	0.07	0.71	0.14
Queue Length 95th (m)	0.3	0.3	1.8	1.8	37.5	3.8
Control Delay (s)	8.2	0.3	9.1	1.2	54.0	23.0
Lane LOS	A	A	A	A	F	C
Approach Delay (s)	0.4		1.9		54.0	23.0
Approach LOS					F	C

Intersection Summary					
Average Delay	7.8				
Intersection Capacity Utilization	53.8%	ICU Level of Service	A		
Analysis Period (min)	15				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	10	5	45	60	15
Future Volume (Veh/h)	20	10	5	45	60	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	5	49	65	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	132	73	81			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132	73	81			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	100			
cM capacity (veh/h)	859	989	1517			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	33	54	81
Volume Left	22	5	0
Volume Right	11	0	16
cSH	898	1517	1700
Volume to Capacity	0.04	0.00	0.05
Queue Length 95th (m)	0.9	0.1	0.0
Control Delay (s)	9.2	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.7	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	5	5	60	70	15
Future Volume (Veh/h)	10	5	5	60	70	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	5	5	65	76	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	159	84	92			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159	84	92			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	829	975	1503			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	70	92
Volume Left	11	5	0
Volume Right	5	0	16
cSH	870	1503	1700
Volume to Capacity	0.02	0.00	0.05
Queue Length 95th (m)	0.4	0.1	0.0
Control Delay (s)	9.2	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.6	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix E
Traffic Control Warrant Excerpts and Analysis

Pedestrian Volume Data

For the purpose of Justification 6: Pedestrian Volume and Delay, an adjusted pedestrian volume is applied to reflect a factored volume based on "Equivalent Adults" and the following definitions:

- Unassisted – Adults and adolescents at or above the age of 12 are considered "Unassisted" pedestrians.

- Assisted – Children under the age of 12, senior citizens, pedestrians with visible disabilities negatively impacting their mobility, and other pedestrians requiring special consideration are termed "Assisted" pedestrians. In cases where an adult is accompanying a pedestrian included in the "Assisted" category, both individuals should be counted as "Assisted" pedestrians to reflect their higher vulnerability. It should be recognized that the exact age of the pedestrian is not critical, but the observer will need to use judgment to place each pedestrian into one of the two categories.

The factored pedestrian volume is calculated as follows:

Adjusted volume = Unassisted Pedestrian Volume + 2 x Assisted Pedestrian Volume

Collision Data

Reportable collisions are collisions involving personal injury or property damage that are serious enough to be reported by the police.

Supplementary Input Data

The following supplementary data may provide a more precise understanding of the operation of the intersection and may assist the analyst to apply additional engineering judgment to the results of the signal justification analysis. Supplementary data that may be obtained for time periods for which the relevant Justification applies include:

- Vehicle Delay – Vehicle-seconds delay determined separately for each approach.

- Gaps – The number, length, and distribution of gaps in vehicular traffic on the main road when side road traffic experiences significant delays.

- Site Conditions – A condition diagram showing the intersection geometrics, lane arrangements, channelization, pavement markings, pedestrian paths, sight distance restrictions, and distance to nearest traffic signals. The condition diagram may also include approach grades, bus stops and routing, on-street parking conditions, driveways, street lighting, utility poles and fixtures, and adjacent land use/plans.

4.4 Justification 1 – Minimum Vehicle Volume

Purpose

The Minimum Vehicle Volume Justification is intended for applications where the principal reason for installing a traffic signal is the cumulative delay produced by a large volume of intersecting traffic at an unsignalized intersection.

Justification 1A reflects the lowest total traffic on all approaches, and Justification 1B reflects the lowest volume on the minor road for which the average delay is similar for both signalized and unsignalized conditions. Therefore, this justification is intended to address the minimum volume conditions for which signalization can be used to minimize total average vehicle delay at the intersection.

As volumes increase beyond threshold criteria, delay to traffic on the minor road will increase, and the overall delay for the intersection will be

greater than would be the case if minor delays were distributed between both main and minor roadways.

Standard

The need for a traffic signal should be considered if both Justification 1A and Justification 1B are 100% fulfilled.

If Justifications 1A and 1B do not reach or exceed 100%, but are at least 80% fulfilled, the lesser fulfilled of the Justifications 1A or 1B can be used in the assessment of Justification 3, the Combination Justification.

In applying Justification 1B (Minimum Vehicle Volume) for "T" intersections, the justification values for the minor street are increased by 50%. This approach reflects the reduction in traffic volumes due to the lack of one of the approaches.

Table 12 may be used for Justification 1: Minimum Vehicle Volume. Restricted Flow is applicable to Urban Conditions, while Free Flow is applicable to Rural conditions (see Section 4.3 for definitions).

Guidelines

Justification 1 evaluates total intersection volume and total minor road volume. The hours selected should represent the eight highest hours of the 24-hour traffic volume, and they do not have to be consecutive hours. Each one of the highest eight hours of the entering volumes is compared to the justification value. The justification should be met for each of the eight hours. "Lowest % Fulfilled" is calculated in Table 12 for reference purposes only and may indicate how close an intersection is to achieving full justification. "Total Across" is calculated by adding all 8-Hour compliance percentages and is for reference purposes only. The Compliance % values used in Table 12 must not exceed 100%.

Table 12 — Justification 1 – Minimum Vehicle Volume

100% SATISFIED – YES ☐ NO ☐
80% SATISFIED – YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT									
APPROACH LANES	1		2 or MORE		HOUR ENDING								TOTAL ACROSS	
FLOW CONDITION	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☐										
A. ALL APPROACH LANES	480 (385)	720 (575)	600 (480)	900 (720)										
	100% FULFILLED													LOWEST% FULFILLED.
	80% FULFILLED													
	ACTUAL % IF BELOW 80% VALUE													
													TOTAL DOWN / 8 =	
B. MINOR STREET BOTH APPROACHES	120* (95)*	170* (135)*	120* (95)*	170* (135)*									TOTAL ACROSS	
	100% FULFILLED													LOWEST% FULFILLED.
	80% FULFILLED													
	ACTUAL % IF BELOW 80% VALUE													
													TOTAL DOWN / 8 =	

* For "T" intersections, these values should be increased by 50%.

4.5 Justification 2 – Delay to Cross Traffic

Purpose

The Delay to Cross Traffic Justification is intended for applications where the traffic volume on the main road is so heavy that traffic on the minor road suffers excessive delay or hazard in entering or crossing the main road.

Standard

The need for a traffic signal should be considered if both Justification 2A and Justification 2B are 100% fulfilled. If Justifications 2A or 2B do not meet or exceed 100%, but both are at least 80% fulfilled, the lesser fulfilled of the justifications 2A or 2B can be used in the assessment of Justification 3, the Combination Justification.

Table 13 may be used for Justification 2: Delay to Cross Traffic. Restricted Flow is applicable to Urban Conditions, while Free Flow is applicable to Rural Conditions (see Section 4.3 for Flow Condition definitions).

Guidelines

Justification 2 evaluates major road volume and minor road movements that cross the intersection. The hours selected should represent the eight highest hours of the 24-hour traffic volume, and they do not have to be consecutive hours. The entering volumes of each of the highest eight hours are compared to the justification value. The justification is met if the justification value is 100% and fulfilled by each of the eight hours.

“Lowest % Fulfilled” is calculated in Table 13 for reference purposes only and may indicate how close an intersection is to achieving full justification. “Total Across” is calculated by adding all 8-Hour compliance percentages and is for reference purposes only. The Compliance % values used in Table 13 must not exceed 100%.

As right turns are not considered as traffic crossing a road, they should be deleted from the combined pedestrian and vehicle volume in the Delay to Cross Traffic Justification. In one-way street systems, left turns from a one-way street into another one-way street should be treated in a similar manner to right turns and be deleted from the justification.

When applying Justification 2B, the crossing volume consists of the sum of:

1. The number of pedestrians crossing the main road.

2. Total left turns from both the side road approaches.

3. The highest through volume from one of the side road approaches.

4. Fifty percent of the heavier left-turn traffic movement from the main road when both of the following criteria are met:

    a) The left-turn volume is greater than 120 vehicles per hour.

    b) The total of the heavier left-turn volume plus its opposing volume is greater than 720 vehicles per hour.

Table 13 — Justification 2 – Delay to Cross Traffic

100% SATISFIED – YES ☐ NO ☐
80% SATISFIED – YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								
FLOW CONDITION	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☐									TOTAL ACROSS
A. MAJOR STREET BOTH APPROACHES	480 (385)	720 (575)	600 (480)	900 (720)									
100% FULFILLED													LOWEST% FULFILLED.
80% FULFILLED													
ACTUAL % IF BELOW 80% VALUE													
												TOTAL DOWN / 8 =	
B. TRAFFIC CROSSING MAJOR STREET	50 (40)	75 (60)	50 (40)	75 (60)									TOTAL ACROSS
100% FULFILLED													LOWEST% FULFILLED.
80% FULFILLED													
ACTUAL % IF BELOW 80% VALUE													
												TOTAL DOWN / 8 =	

4.6 Justification 3 – Volume/Delay Combination

Purpose

Signals may occasionally be justified where neither Justification 1 nor Justification 2 is 100% satisfied, but both justifications are at least 80% satisfied.

Standard

The requirements for the Volume/Delay Combination Justification are given in Table 14.

Guidelines

Justification 3 should only be applied after an adequate trial of other remedial measures designed to reduce delay and inconvenience to traffic have failed to solve the operational issues at the intersection. Explicit consideration should be given to the safety benefits and disadvantages of installing traffic signal control. Section 4.13 sets out an alternate recommended practice for undertaking and assessing the relative safety effects.

Table 14 — Justification 3 – Volume/Delay Combination

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	**Minimum Vehicular Volume**	YES ☐	NO ☐	YES ☐	NO ☐
Justification 2	**Delay to Cross Traffic**	YES ☐	NO ☐		

4.11 Justification 7 – Projected Volumes

In some cases, it is desirable to determine the future need for traffic signals at an existing or planned intersection. There are two basic scenarios.

1. The intersection may exist and all that is changing is the addition of one or more developments which will add traffic to the intersection.

2. A development which will require, or be associated with, the construction of one or more new legs at an existing intersection or a completely new intersection or roadway.

The prediction of future traffic demands is based on knowledge of growth in roadway usage, growth of local traffic generators and predicted traffic volumes, obtained from a traffic impact study, transportation planning study, environmental assessment, or other similar evaluation. It is incumbent upon the road authority to ensure that the calculation methodology is sound and is based on good data, so that there is a high level of confidence in the predicted traffic volumes.

The preferred approach is that 8-Hour volume projections are estimated as part of the engineering study and evaluated against Justifications 1, 2 or 3.

Analysis Using 8-Hour Volumes

If eight-hour projections are available, Justifications 1, 2 or 3 should be used. For the situation of an existing intersection with new development, Justifications 1 or 2 need to be met to 100%, or Justification 3 both needs to be met to 80%.

Often for future development, especially where the intersection or road may not exist, eight-hour volumes may be difficult to obtain or predict with the necessary accuracy. If eight-hour volumes are unavailable or not considered to be of sufficient accuracy, Justification 7 can be applied by using Peak Hour Volumes (PHV) estimated as part of the transportation study and reduced to Average Hourly Volumes (AHV) as input to Justification 7.

Analysis Using Average Hour Volume

The Average Hourly Volume for a typical day can be estimated from the Peak Hour Volumes using the following relationships:

$$AHV = \frac{PHV}{2} \text{ or } AHV = \frac{amPHV + pmPHV}{4}$$

Alternately, the Average Hourly Volume for the eight highest hours of an average day can be estimated from Annual Average Daily Traffic (AADT) volume using the following relationship:

$$AHV = \frac{AADT}{16}$$

Where:

AHV = Average hourly volume

AADT = Annual average daily traffic

PHV = Peak Hour Volume (represents 1 hour of time)

A number of factors affect the accuracy of traffic volume projections. It is also clear that each of these factors can insert significant variability into the prediction calculation, and it is extremely difficult to remove or minimize this variability. Some of the elements that create uncertainty are as follows:

- The use of an average hour in the Justification 7 signal warrants, rather than requiring all eight hours to meet the standard, introduces an error factor.

- If the projections are taken from the ITE Trip Generation Manual, some of these studies are outdated and are primarily U.S. based so they are not totally reflective of Canadian conditions. The studies may not have been made at a location or during a time period when Sunday shopping was allowed, and the variability of the results for some of the studies is very large and not confidence inspiring.

- Background traffic, which has its own separate projection, may be affected by unexpected factors.

- Developments do not always evolve exactly as planned, in terms of timing, store or residence type and customer response.

- The methods of projection themselves could have built in errors. An example of these methods is the proxy sites method that is hard to generalize its projection factors as there are always differences in the site conditions.

As a result, the variability in outcomes, relative to predictions, is potentially very high and it is not appropriate to try to assign a single factor or factors to reflect these sources of variability. A revised approach is recommended for responding to requests for future traffic signals, based on development and growth.

The intent of this justification is to determine the likelihood that a traffic signal would be warranted in the future.

The first step is to calculate the AHV based on either:

1) projected future volumes for the AM and PM peak periods, or

2) projected AADT, depending on availability of peak hourly volumes. If only one time period of projected data is available, this should be used, but only after attempting to obtain or calculate both AM and PM peak data.

The next step is to apply the following criteria to determine which of the following cases are met:

- Case 1: The traffic signal is certainly warranted – the suggested threshold for this condition is meeting 200 % or more of Justifications 1 or 2.

- Case 2: The traffic signal might be warranted – falls between cases 1 and 3, somewhere between 100% and 199% of Justifications 1 or 2.

- Case 3: Signal warrant is unlikely – meets less than 100% of Justifications 1 or 2.

For Case 1, the traffic signal can be installed at the time of development, at the cost (or shared cost) of the developer. The understanding would be that the activation (actual turn-on) of the signals would still be delayed until the minimum flow levels in the Justification are met.

For Case 2, the need for the traffic signal cannot be known for certain. Jurisdictions could request and hold securities from the developer and operate the intersection under two-way or all-way stop control until such time as one of the Justifications is met as evidenced by actual 8-hours counts on a representative day. In the event that the Justification is not met after five years, the securities are returned. An alternative would be for the jurisdiction to require the developer install the initial underground traffic plant or roadway reconfiguration in advance of the signal, whereas this would not occur under Case 3.

For Case 3, where the signal warrant is unlikely, it is not recommended to hold any securities or install any underground traffic signal plant and the intersection should continue to operate under two-way or all-way stop control. Once the development

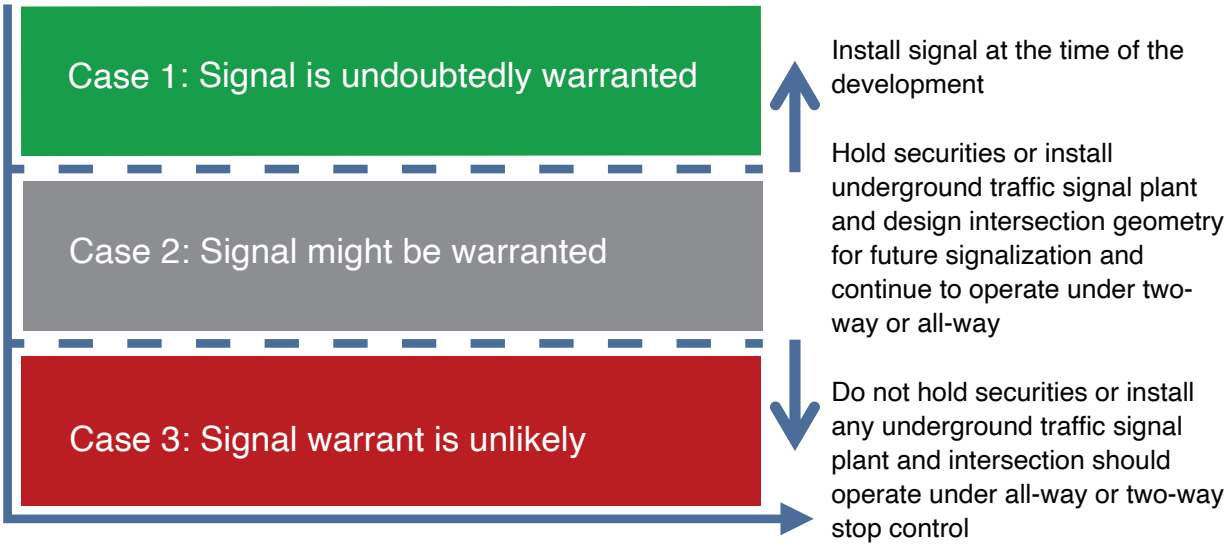


Figure 32 — Likelihood of Traffic Signal Being Justified Using Projected Volumes

is complete the jurisdiction can perform a full 8-Hour Turning Movement Count (TM) and determine if traffic signals are now justified or place the intersection into an appropriate monitoring sequence depending on how close to being warranted the intersection is.

4.12 Signal Installation Prioritization

Due to funding limitations or other constraints, it may not be possible to implement all signals that meet the minimum technical justification criteria network-wide. It is therefore important to understand the relative value of each candidate set of traffic signals so that effort may be directed first to the site that would provide the greatest overall benefits. The benefits are normally expressed in terms of benefit/cost ratios with safety and the movement of people and goods the prime considerations.

One approach is to examine the justification analysis for each potential location and rank the sites by the degree to which they meet each justification. This approach should ensure that the collision history is integrated into the prioritization process. A weighting may be placed on each of the justification components to assign priority. Determination of a weighting scheme is the responsibility of the road authority.

Project No. 6860-39
Intersection Wellington Road 19 / 3 Line **Base Scenario**

ITE 210 - Single-Family Detached Housing Temporal Variation

Time Ending	% of daily total	% of daily peak hour
8:00	6.7	100%
9:00	6.2	93%
12:00	5.2	78%
13:00	5.5	61%
14:00	6	67%
16:00	7.2	80%
17:00	9	100%
18:00	8.8	98%

Temporal Variation

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	AM Peak
9:00	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	
12:00	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	
13:00	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	
14:00	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	
16:00	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	PM Peak
18:00	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	

Existing Volumes (2022 Counts)

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	8	0	5	0	0	0	1	122	12	1	135	0	
9:00	45	1	6	0	0	2	2	117	33	5	166	0	AM Peak
12:00	15	0	5	2	0	4	1	151	10	4	155	0	
13:00	16	0	3	0	0	0	4	152	22	5	132	2	
14:00	16	0	6	0	0	2	2	156	17	2	139	1	
16:00	16	0	7	1	0	2	3	191	16	9	155	0	
17:00	48	0	4	1	0	3	5	212	48	3	202	0	PM Peak
18:00	14	0	3	0	0	2	3	194	21	1	175	0	

2038 Corridor Growth Volumes

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	0	0	0	0	0	0	0	54	0	0	70	0	
9:00	0	0	0	0	0	0	0	50	0	0	65	0	AM Peak
12:00	0	0	0	0	0	0	0	42	0	0	55	0	
13:00	0	0	0	0	0	0	0	55	0	0	52	0	
14:00	0	0	0	0	0	0	0	60	0	0	57	0	
16:00	0	0	0	0	0	0	0	72	0	0	68	0	
17:00	0	0	0	0	0	0	0	90	0	0	85	0	PM Peak
18:00	0	0	0	0	0	0	0	88	0	0	83	0	

Site Traffic

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	5	0	32	0	0	0	0	65	5	16	38	0	
9:00	5	0	30	0	0	0	0	60	5	15	35	0	AM Peak
12:00	4	0	25	0	0	0	0	50	4	13	29	0	
13:00	6	0	15	0	0	0	0	31	3	24	49	0	
14:00	7	0	17	0	0	0	0	33	3	27	53	0	
16:00	8	0	20	0	0	0	0	40	4	32	64	0	
17:00	10	0	25	0	0	0	0	50	5	40	80	0	PM Peak
18:00	10	0	24	0	0	0	0	49	5	39	78	0	

2038 Future Total

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	All	Minor	Major	Minor Veh+ped
8:00	13	0	37	0	0	0	1	241	17	17	243	0	570	89	553	13
9:00	50	1	36	0	0	2	2	227	38	20	266	0	642	89	553	51
12:00	19	0	30	2	0	4	1	243	14	17	239	0	569	55	514	21
13:00	22	0	18	0	0	0	4	238	25	29	233	2	571	40	531	22
14:00	23	0	23	0	0	2	2	249	20	29	249	1	598	47	550	23
16:00	24	0	27	1	0	2	3	303	20	41	287	0	708	54	654	25
17:00	58	0	29	1	0	3	5	352	53	43	367	0	911	91	820	59
18:00	24	0	27	0	0	2	3	331	26	40	336	0	789	53	736	24

8-Hour Volume

Future Total (2038)			
Time Ending		Major	Minor
8:00		520	51
9:00		553	89
12:00		514	55
13:00		531	40
14:00		550	47
16:00		654	54
17:00		820	91
18:00		736	53
Total		**4878**	**481**

TRAFFIC SIGNAL WARRANTS - OTM Book 12, Justifications 1 & 2

FUTURE

Justification	Requirement 1 lane Free Flow	Hour Ending 8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Avg	Sectional Percent
1. Min Vehicle Volumes											
A. Vehicle volumes all approaches	**480**	570	642	569	571	598	708	911	789		
	Score	*119%*	*134%*	*119%*	*119%*	*125%*	*148%*	*190%*	*164%*		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	
B. Vehicle volumes, minor streets	**120**	89	89	55	40	47	54	91	53		54%
	Score	*74%*	*74%*	*46%*	*34%*	*39%*	*45%*	*76%*	*44%*		
		74%	74%	46%	34%	39%	45%	76%	44%	54%	
2. Delay to Cross Traffic											
A. Vehicle volumes, major street	**480**	553	553	514	531	550	654	820	736		
	Score	*115%*	*115%*	*107%*	*111%*	*115%*	*136%*	*171%*	*153%*		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	
B. Combined vehicle+ped minor street	**50**	13	51	21	22	23	25	59	24		57%
	score	*27%*	*102%*	*42%*	*44%*	*45%*	*50%*	*118%*	*48%*		
		27%	100%	42%	44%	45%	50%	100%	48%	57%	

OVERALL WARRANT FOR TRAFFIC SIGNAL IS 57%

Project No. 6860-39
Intersection Wellington Road 19 / 2 Line **Base Scenario**

ITE 210 - Single-Family Detached Housing Temporal Variation

Time Ending	% of daily total	% of daily peak hour
8:00	6.7	100%
9:00	6.2	93%
12:00	5.2	78%
13:00	5.5	61%
14:00	6	67%
16:00	7.2	80%
17:00	9	100%
18:00	8.8	98%

Temporal Variation

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	AM Peak
9:00	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	
12:00	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	
13:00	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	
14:00	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	67%	
16:00	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	PM Peak
18:00	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	

Existing Volumes (2022 Counts)

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	11	44	106	4	25	14	12	196	5	60	238	12	
9:00	11	23	102	11	31	16	16	201	9	57	217	13	AM Peak
12:00	3	11	52	1	5	10	7	101	6	58	122	0	
13:00	10	8	65	2	13	3	7	99	9	49	103	2	
14:00	5	7	61	3	13	4	6	126	14	60	106	2	
16:00	18	12	58	4	10	14	10	161	11	59	123	3	
17:00	14	31	110	11	29	12	9	202	12	52	200	14	PM Peak
18:00	13	27	94	11	27	9	10	237	9	69	206	11	

2038 Corridor Growth Volumes

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	0	0	0	0	0	0	0	54	0	0	70	0	
9:00	0	0	0	0	0	0	0	50	0	0	65	0	AM Peak
12:00	0	0	0	0	0	0	0	42	0	0	55	0	
13:00	0	0	0	0	0	0	0	55	0	0	52	0	
14:00	0	0	0	0	0	0	0	60	0	0	57	0	
16:00	0	0	0	0	0	0	0	72	0	0	68	0	
17:00	0	0	0	0	0	0	0	90	0	0	85	0	PM Peak
18:00	0	0	0	0	0	0	0	88	0	0	83	0	

Site Traffic

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	0	0	22	5	0	0	0	27	0	54	76	27	
9:00	0	0	20	5	0	0	0	25	0	50	70	25	AM Peak
12:00	0	0	17	4	0	0	0	21	0	42	59	21	
13:00	0	0	37	9	0	0	0	49	0	24	31	6	
14:00	0	0	40	10	0	0	0	53	0	27	33	7	
16:00	0	0	48	12	0	0	0	64	0	32	40	8	
17:00	0	0	60	15	0	0	0	80	0	40	50	10	PM Peak
18:00	0	0	59	15	0	0	0	78	0	39	49	10	

2038 Future Total

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	All	Minor	Major	Minor Veh+ped
8:00	11	44	128	9	25	14	12	277	5	114	384	39	1062	219	798	64
9:00	11	23	122	16	31	16	16	276	9	107	352	38	1017	219	798	58
12:00	3	11	69	5	5	10	7	164	6	100	235	21	636	103	533	19
13:00	10	8	102	11	13	3	7	203	9	73	186	8	633	147	486	34
14:00	5	7	101	13	13	4	6	239	14	87	196	9	694	143	551	31
16:00	18	12	106	16	10	14	10	297	11	91	231	11	827	176	651	46
17:00	14	31	170	26	29	12	9	372	12	92	335	24	1126	282	844	71
18:00	13	27	153	26	27	9	10	403	9	108	338	21	1143	254	889	66

8-Hour Volume

Future Total (2038)			
Time Ending		Major	Minor
8:00		831	231
9:00		798	219
12:00		533	103
13:00		486	147
14:00		551	143
16:00		651	176
17:00		844	282
18:00		889	254
Total		**5583**	**1555**

TRAFFIC SIGNAL WARRANTS - OTM Book 12, Justifications 1 & 2

FUTURE

Justification	Requirement 1 lane Free Flow	Hour Ending 8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Avg	Sectional Percent
1. Min Vehicle Volumes											
A. Vehicle volumes all approaches	**480**	1062	1017	636	633	694	827	1126	1143		
	Score	*221%*	*212%*	*133%*	*132%*	*145%*	*172%*	*235%*	*238%*		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	
B. Vehicle volumes, minor streets	**120**	219	219	103	147	143	176	282	254		98%
	Score	*183%*	*183%*	*86%*	*122%*	*119%*	*147%*	*235%*	*212%*		
		100%	100%	80%	100%	100%	100%	100%	100%	98%	
2. Delay to Cross Traffic											
A. Vehicle volumes, major street	**480**	798	798	533	486	551	651	844	889		
	Score	*166%*	*166%*	*111%*	*101%*	*115%*	*136%*	*176%*	*185%*		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	
B. Combined vehicle+ped minor street	**50**	64	58	19	34	31	46	71	66		81%
	score	*129%*	*116%*	*38%*	*68%*	*62%*	*92%*	*142%*	*131%*		
		100%	100%	38%	68%	62%	80%	100%	100%	81%	

OVERALL WARRANT FOR TRAFFIC SIGNAL IS 98%

OTM BOOK 12 - JUSTIFICATION 7 - Wellington Road 19 / Site Access

STEP 1

	All Approaches	Minor Streets	Major Street	Combined Vehicle and Pedestrian Crossing Artery from Minor Streets		
amPHV	780	210	570	150	(145+5)	Lefts + peds
pmPHV	1125	155	970	100	(95+5)	Lefts + peds
AHV	**476**	**91**	**385**	**63**	AHV = (amPHV+pmPHV)/4	
		1B	2A	**2B**		

STEP 2

JUSTIFICATION 7

Justification	Description	Minimum Requirement 1 Lane Highways				Compliance		
						Sectional		ENTIRE
		Free Flow	Restr. Flow	Restr. Flow	Free Flow	Numerical	%	%
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	Does not apply.			480	476	99%	76%
	B. Vehicle volume, along minor streets (average hour)				120	91	76%	
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)				480	385	80%	80%
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)				50	63	125%	

Note: For "T" intersections, 1B values should be increased by 50%.* *(The intersection is not a "T" configuration thus values are increased in the above table.)***

Result: 80%
Required: 100%
NOT WARRANTED

Analysis Using Average Hour Volume
For traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a **50% increase for a future intersection** or roadway.

average delay to all minor street traffic (vehicles and pedestrians) of greater than 30 seconds for the entire eight hour period; and,

- The volume split does not exceed 70/30 (that is the minor street must not be less than 30% of the total volume entering the intersection) as measured over the entire eight-hour count period. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway. For three-legged intersections a volume split of 75/25 is permissible.

All-Way Stop Minimum Volume Warrant (Collector Roads and Rural Arterial Roads)

All-way stop control may be considered on collector roads, or rural arterial roads, where the following conditions are met:

- The total vehicle volume on all intersection approaches exceeds 375 vehicles per hour for each of the highest eight hours of the day; and,
- The combined vehicle and pedestrian volume on the minor street exceeds 150 units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours as the total volume; OR the combined vehicle and pedestrian volume on the minor street exceeds 120 units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours as the total volume, with an average delay to all minor street traffic (vehicles and pedestrians) of greater than 30 seconds for the entire eight hour period; and,
- The volume split does not exceed 70/30 (that is the minor street must not be less than 30% of the total volume entering the intersection) as measured over the entire eight-hour count period. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway. For three-legged intersections a volume split of 75/25 is permissible.

All-Way Stop Minimum Volume Warrant (Local Roads)

All-way stop control may be considered on minor or local roads where the following conditions are met:

- The total vehicle volume on all intersection approaches exceeds 200 vehicles per hour for each of the highest four hours of the day; and,
- The combined vehicle and pedestrian volume on the minor street exceeds 75 units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same four hours as the total volume; and,
- The volume split does not exceed 70/30 (that is the minor street must not be less than 30% of the total volume entering the intersection) as measured over the entire four-hour count period. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway. For three-legged intersections a volume split of 75/25 is permissible.

All-Way Stop Collision Warrant

All-way stop control may be warranted for a location experiencing an unusually high number of right-angle or turning collisions, as defined by comparison with similar locations through network screening (T*AC Guidelines for Network Screening of Collision-Prone Locations*) or over-representation analysis (*TAC Canadian Guide to In-Service Road Safety Reviews*) by conducting a statistical comparison in proportions of target collisions (right-angle/turning movement collisions) of the subject location with that of similar locations in the jurisdiction.

If data and procedures are available, employ a methodology that removes regression to the mean and identifies locations that are clearly operating with below average safety compared to similar intersections within a jurisdiction.

If frequency data is the only data that is available, use the following thresholds:

- Local/Collector/Rural Arterial: 3 collisions/year over three years (i.e. 9 collisions in 36 months)
- Urban Arterial: 4 collisions/year over three years (i.e. 12 collisions in 36 months)

Only those collisions susceptible to improvement through multi-way stop control must be considered (i.e., right-angle and turning type collisions).

All-Way Stop Visibility Warrant

Under some circumstances, sufficient sight distance is not available for traffic exiting the stop-controlled approaches of a two-way stop intersection, based on geometric design requirements. If all efforts to improve the sight distance have been exhausted and the sight distance cannot be brought up to the guidelines, conversion of the intersection to all-way stop operation may be considered. Special advance warning or overhead flashing lights may be necessary to augment the control if vertical or horizontal alignment is a factor.

Inappropriate Use of All-Way Stop Control

All-way stop controls should not be used under the following conditions:

- Where the protection of pedestrians, school children in particular, is a prime concern and the concern cannot be directly addressed by other means;
- On roads within urban areas having a posted speed limit in excess of 60 km/h;
- At intersections that are not roundabouts having fewer than three, or more than four, approaches;
- At intersections that are offset, poorly defined or geometrically substandard;

Project No. 6860-39
Intersection Wellington Road 19 / 3 Line

2038 Future Total

Time Ending	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
8:00	13	0	37	0	0	0	1	241	17	17	243	0	
9:00	50	1	36	0	0	2	2	227	38	20	266	0	AM Peak
12:00	19	0	30	2	0	4	1	243	14	17	239	0	
13:00	22	0	18	0	0	0	4	238	25	29	233	2	
14:00	23	0	23	0	0	2	2	249	20	29	249	1	
16:00	24	0	27	1	0	2	3	303	20	41	287	0	
17:00	58	0	29	1	0	3	5	352	53	43	367	0	PM Peak
18:00	24	0	27	0	0	2	3	331	26	40	336	0	

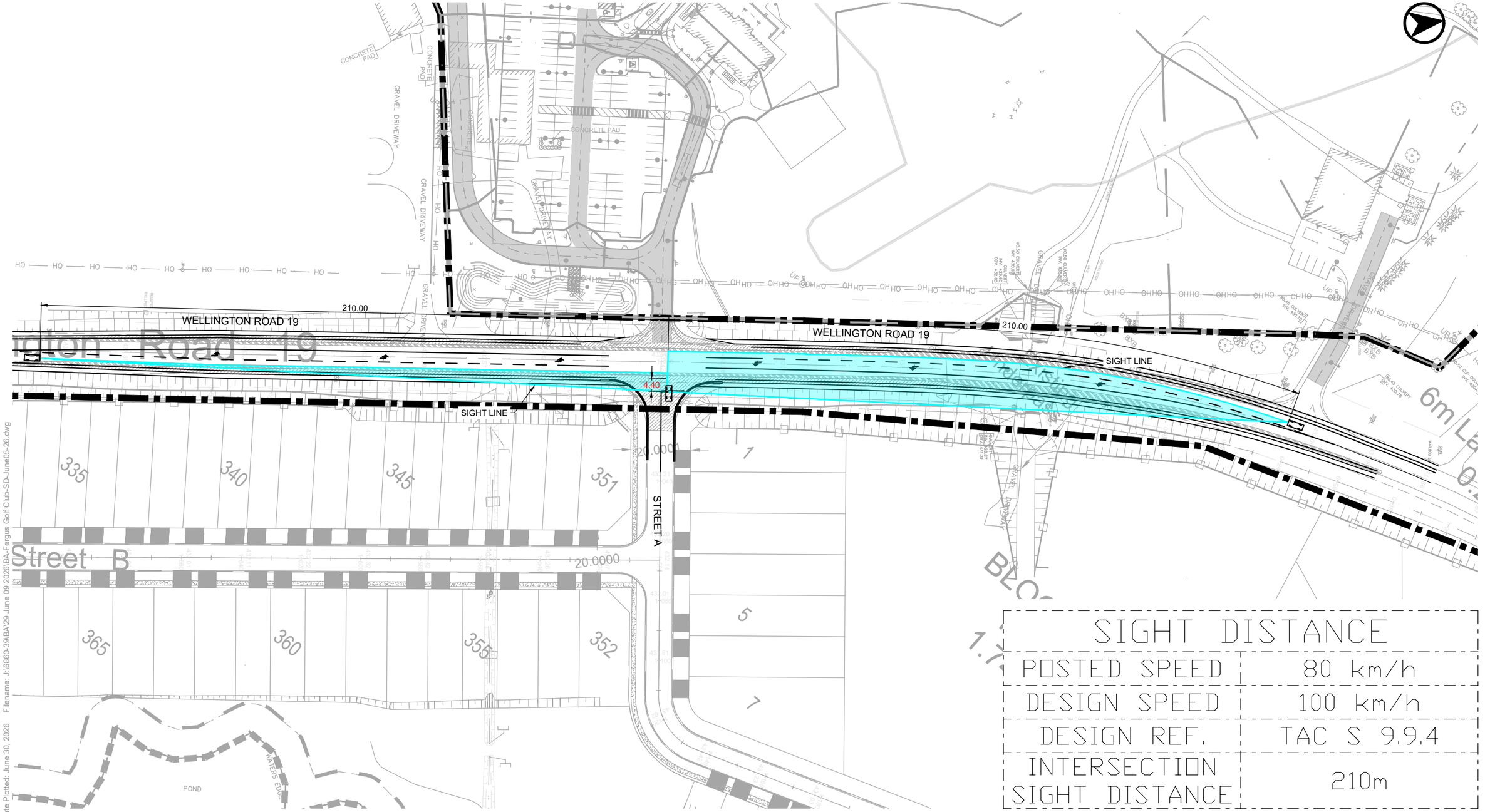
Warrant for Collector Roads and Rural Arterial Roads

2038 Future Total				Exceeds 375 Vehicles	Minor Street > 120	Minor Street Percentage	Minor Street > 30%	AWSC Warranted
Time Ending	Total	Major	Minor					
8:00	570	520	51	YES	NO	9%	NO	
9:00	642	553	89	YES	NO	14%	NO	
12:00	569	514	55	YES	NO	10%	NO	
13:00	571	531	40	YES	NO	7%	NO	
14:00	598	550	47	YES	NO	8%	NO	
16:00	708	654	54	YES	NO	8%	NO	
17:00	911	820	91	YES	NO	10%	NO	
18:00	789	736	53	YES	NO	7%	NO	
Average	**670**	**610**	**60**	**YES**	**NO**	**9%**	**NO**	**NO**

Warrant for Local Roads

2038 Future Total				Exceeds 200 Vehicles	Minor Street > 75	Minor Street Percentage	Minor Street > 30%	AWSC Warranted
Time Ending	Total	Major	Minor					
9:00	570	520	51	YES	NO	9%	NO	
16:00	708	654	54	YES	NO	8%	NO	
17:00	911	820	91	YES	YES	10%	NO	
18:00	789	736	53	YES	NO	7%	NO	
Average	**745**	**682**	**62**	**YES**	**NO**	**8%**	**NO**	**NO**

Appendix F
Sight Distance Assessments



SIGHT DISTANCE	
POSTED SPEED	80 km/h
DESIGN SPEED	100 km/h
DESIGN REF.	TAC S 9.9.4
INTERSECTION SIGHT DISTANCE	210m

BA Group

FERGUS GOLF COURSE REDEVELOPMENT

SIGHT DISTANCE REVIEW

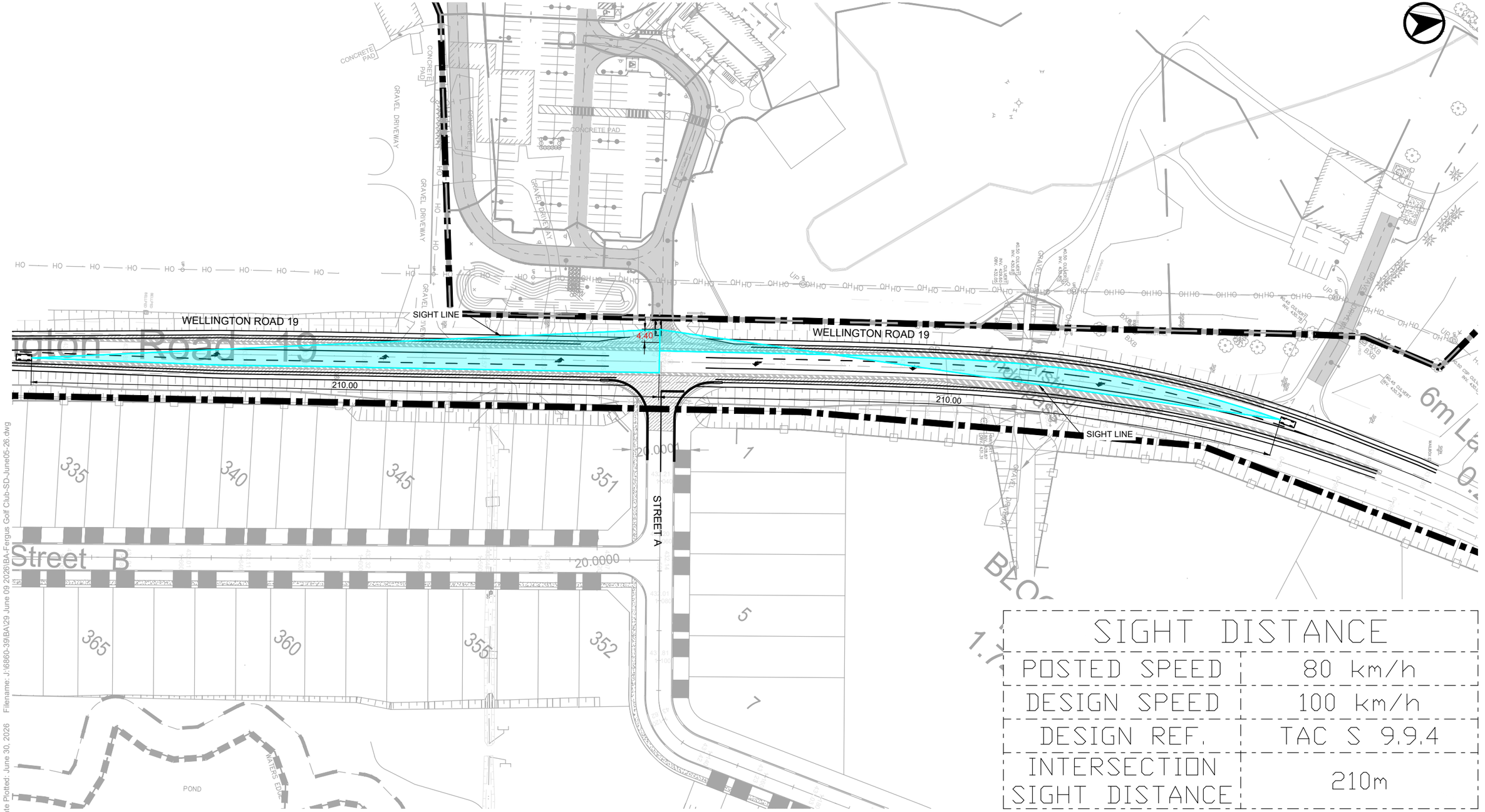
WELLINGTON ROAD 19 AND STREET D - SITE ACCESS

Project:	FERGUS GC
Project No.	6860-39
Date:	2024-05-28
Revised:	2026-06-26

Scale 1:1,250 (0 – 25 – 50m)

Drawing No. SD-01

Date Plotted: June 30, 2026 Filename: J:\6860-39\BA\29 June 09 2026\BA-Fergus Golf Club-SD-June05-26.dwg



SIGHT DISTANCE	
POSTED SPEED	80 km/h
DESIGN SPEED	100 km/h
DESIGN REF.	TAC S 9.9.4
INTERSECTION SIGHT DISTANCE	210m

Date Plotted: June 30, 2026 Filename: J:\6860-39\BA\29 June 09 2026\BA-Fergus Golf Club-SD-June05-26.dwg

BA Group

FERGUS GOLF COURSE REDEVELOPMENT

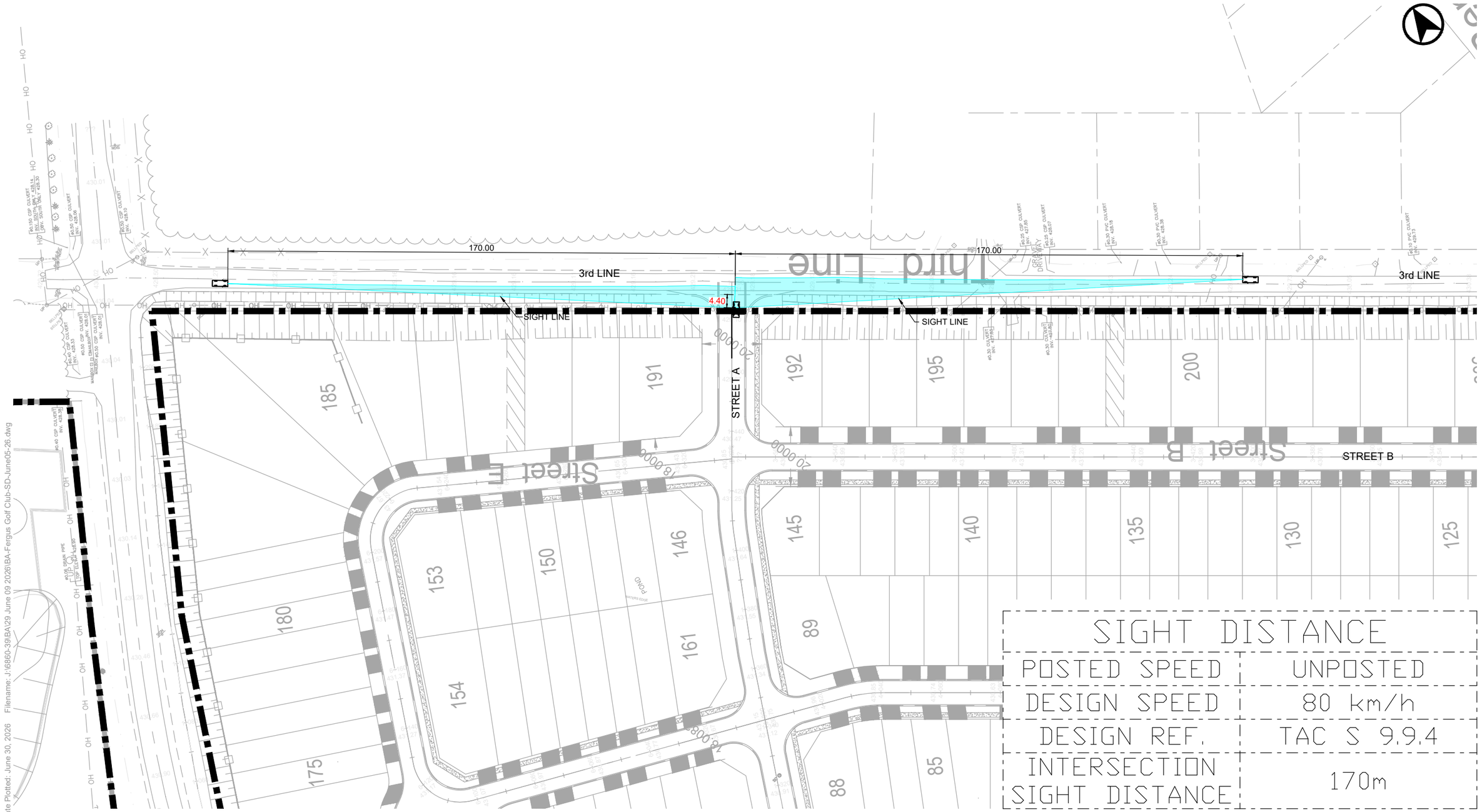
SIGHT DISTANCE REVIEW

WELLINGTON ROAD 19 AND STREET D - GOLF CLUB DRIVEWAY

Project:	FERGUS GC
Project No.	6860-39
Date:	2024-05-28
Revised:	2026-06-26

Scale 1:1,250 (0 – 25 – 50m)

Drawing No. SD-02



SIGHT DISTANCE	
POSTED SPEED	UNPOSTED
DESIGN SPEED	80 km/h
DESIGN REF.	TAC S 9.9.4
INTERSECTION SIGHT DISTANCE	170m

BA Group

FERGUS GOLF COURSE REDEVELOPMENT

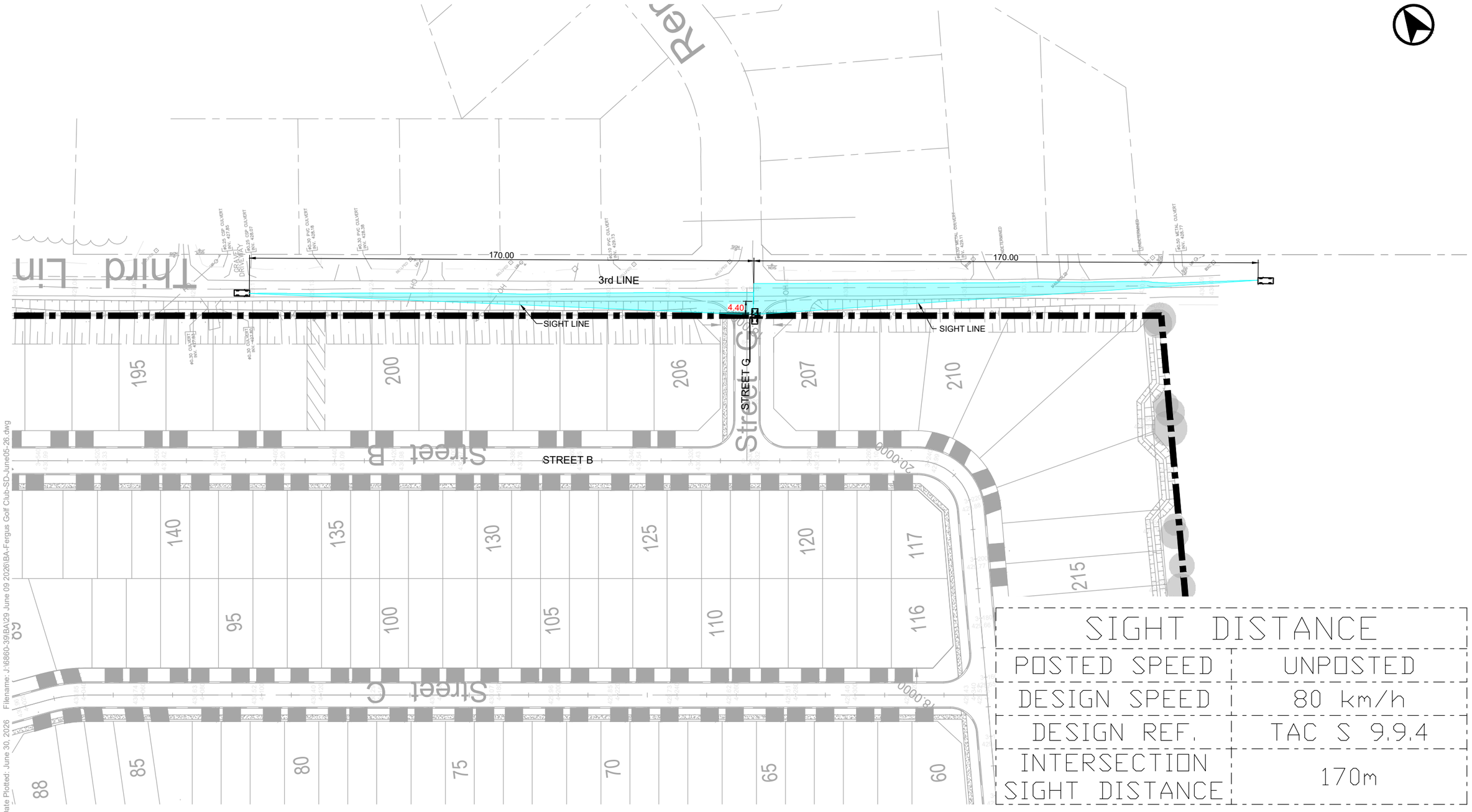
SIGHT DISTANCE REVIEW

3rd LINE AND STREET D

Project:	FERGUS GC
Project No.	6860-39
Date:	2024-05-28
Revised:	2026-06-26

Scale 1:1,250 (0 – 25 – 50m)

Drawing No. SD-03



SIGHT DISTANCE	
POSTED SPEED	UNPOSTED
DESIGN SPEED	80 km/h
DESIGN REF.	TAC S 9.9.4
INTERSECTION SIGHT DISTANCE	170m

FERGUS GOLF COURSE REDEVELOPMENT

SIGHT DISTANCE REVIEW

3rd LINE AND STREET G

BA Group

Project:	FERGUS GC
Project No.	6860-39
Date:	2024-05-28
Revised:	2026-06-26

Scale 1:1,250 (0 – 25 – 50m)

Drawing No. SD-04

Date Plotted: June 30, 2026 Filename: J:\6860-39\BA\29 June 09 2026\BA-Fergus Golf Club-SD-June09-26.dwg

Appendix G
Correspondence with Triton Engineering

From:	Deanna Green
To:	"Howard Wray"
Cc:	Eric Gilmour
Subject:	RE: Fergus Golf Club Development Peer Review
Date:	November 14, 2022 8:30:16 AM
Attachments:	image001.jpg image004.jpg image005.jpg

Howard,

Thank you so much for this additional information. We will provide further information - such as the profile - in our revised report regarding the use of survey data.

Regards,

Deanna

From: Howard Wray <hwray@tritoneng.on.ca>
Sent: November 14, 2022 8:27 AM
To: Deanna Green <Deanna.Green@bagroup.com>
Cc: Eric Gilmour <Eric.Gilmour@bagroup.com>
Subject: RE: Fergus Golf Club Development Peer Review

Hi Deanna,

No problem with contacting me.

My reference to Field Measurements would include an analysis based on a survey. Provided it was based on a suitable number of elevation points, arial data could be sufficient. Please provide the profile as an attachment.

Regards,

Howard Wray, P. Eng.

Triton Engineering Services Limited
229 Broadway, Unit 1 Orangeville, ON L9W 1K4
Tel (519) 941-0330 ext 223 • Fax (519) 941-1830 • *www.tritoneng.on.ca*

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From: Deanna Green <Deanna.Green@bagroup.com>
Sent: November 11, 2022 3:35 PM
To: Howard Wray <hwray@tritoneng.on.ca>
Cc: Eric Gilmour <Eric.Gilmour@bagroup.com>

Subject: Fergus Golf Club Development Peer Review

Howard,

I hope that it's ok to follow up with you directly. If not…please feel free to redirect me.☺

We just wanted to follow up on the comment that was provided to us regarding the proposed Fergus Golf Club development. Your comments (attached) that a sight distance field measurement is required to confirm sight distance at the new access points along Wellington 19. Please note that the south access has been eliminated and the new site plan includes only the north access, to be aligned with a relocated golf club driveway.

BA Group's February 2022 report stated that:

> *"Due to COVID, a comprehensive sight distance review was completed for the two proposed access points to the SE Site utilizing aerial photos."*

We wanted to follow up to confirm that both the vertical and horizontal profile data obtained from surveys were also used to confirm the sight distance.

Before we make arrangements for a field study to confirm the sight distance, we wanted to confirm that a field study is still required, even if we have confirmed the sight distance with both horizontal and vertical survey data.

We look forward to hearing from you.

Thank you.

Deanna

Deanna Green, MSc.P.Eng.
Associate

BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto, ON M4V 1K9

TEL 416 961 7110 x149
EMAIL Deanna.Green@bagroup.com

Image removed by sender. BA Consulting Group Ltd

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Appendix H
Left-Turn Lane Warrant Analysis

Left-Turn Lane Warrant Analysis – Wellington 19 at Site Driveway (Future Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

AM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 265$

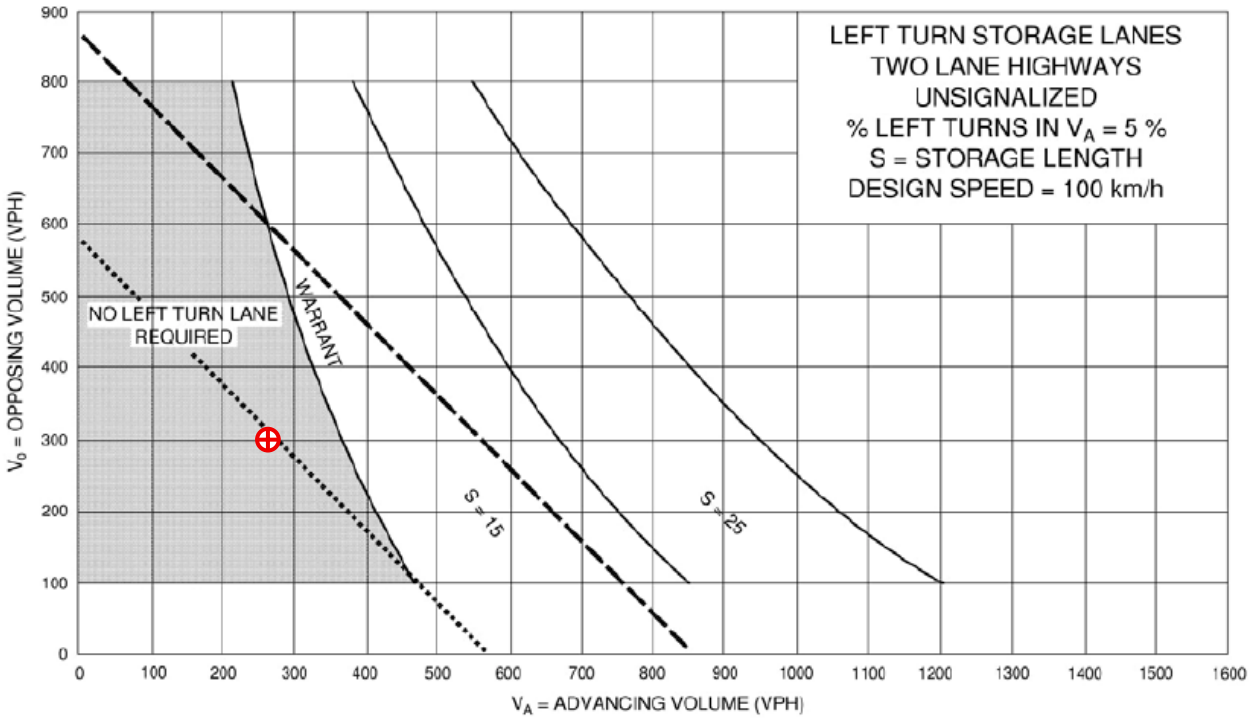
Opposing Traffic Volume: $V_O = 305$

Left Turn Traffic Volume: $V_L = 10$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{265} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 3.8\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 305$

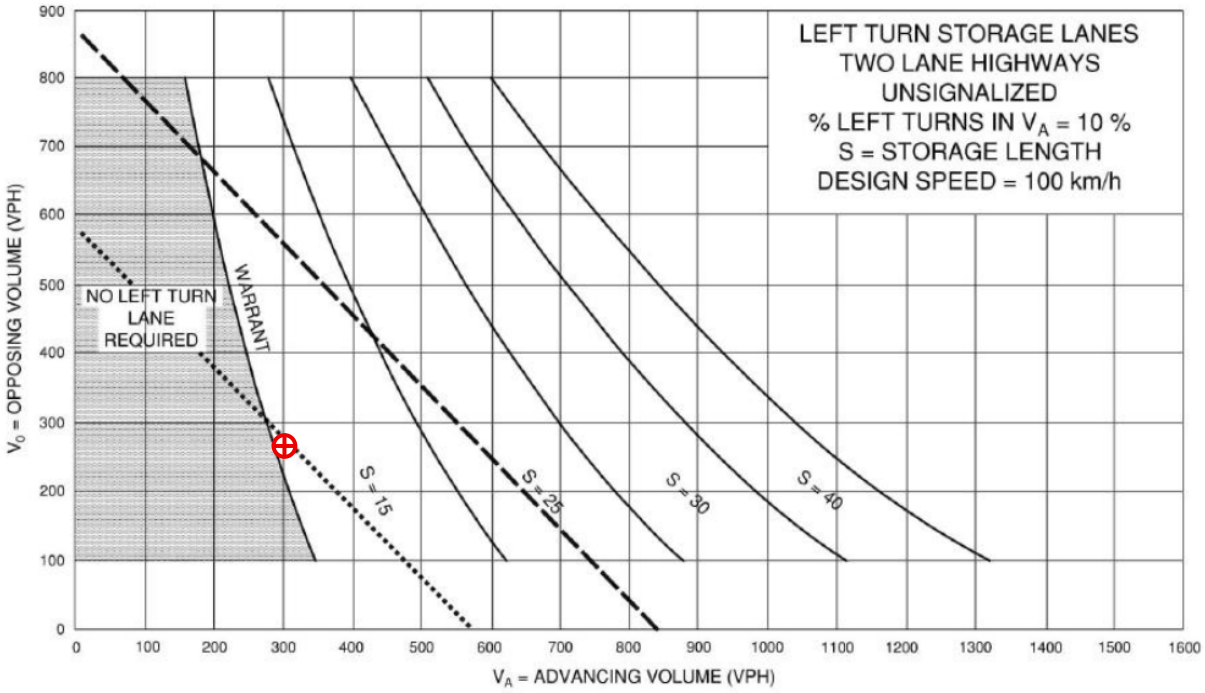
Opposing Traffic Volume: $V_O = 265$

Left Turn Traffic Volume: $V_L = 25$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{25}{305} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 8.2\%$$



PM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 525$

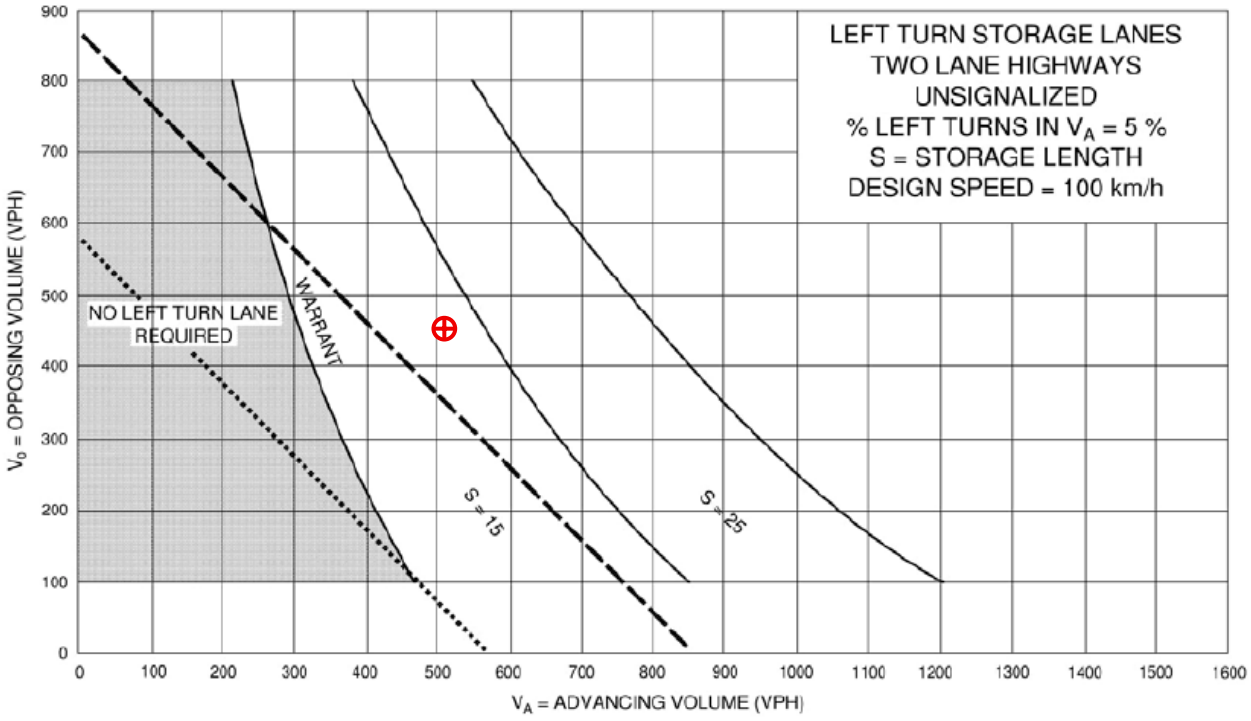
Opposing Traffic Volume: $V_O = 445$

Left Turn Traffic Volume: $V_L = 15$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{525} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.9\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 445$

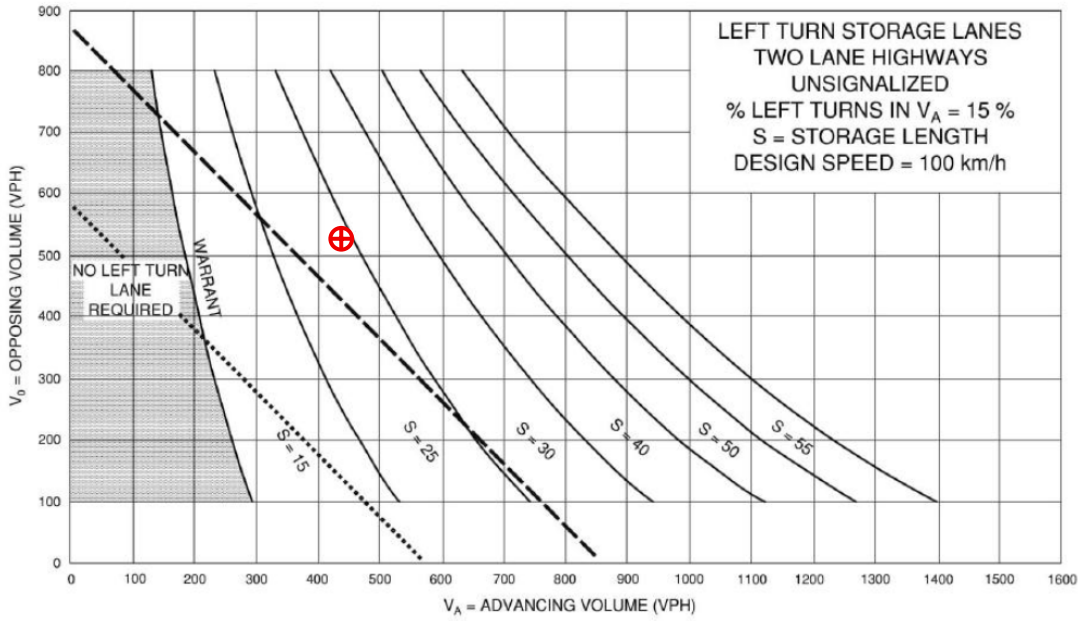
Opposing Traffic Volume: $V_O = 525$

Left Turn Traffic Volume: $V_L = 75$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{75}{445} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 16.9\%$$



SAT Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 595$

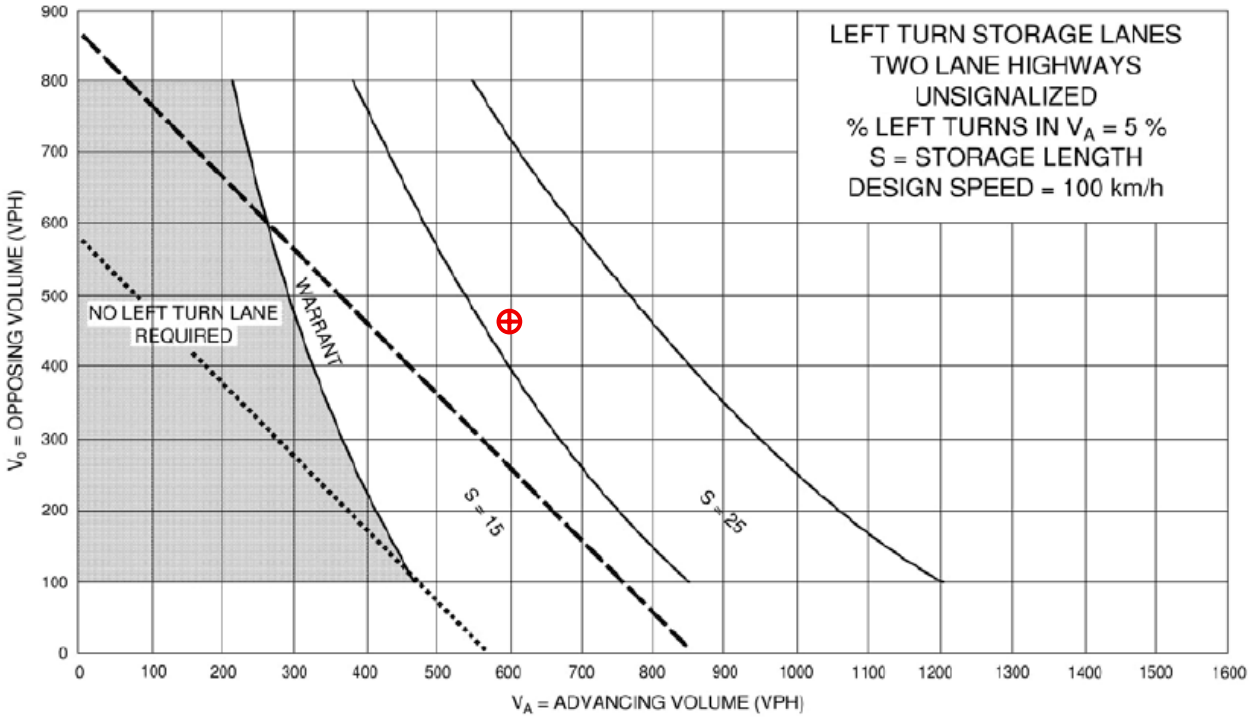
Opposing Traffic Volume: $V_O = 460$

Left Turn Traffic Volume: $V_L = 15$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{595} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.5\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 460$

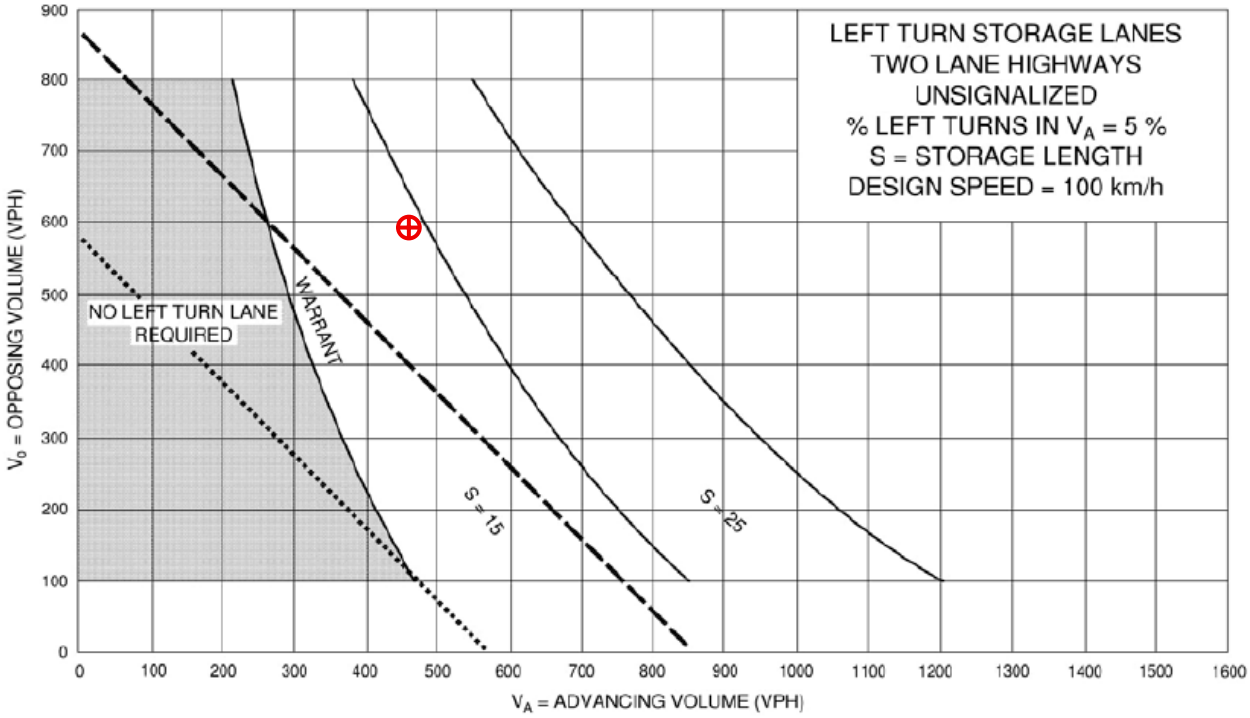
Opposing Traffic Volume: $V_O = 595$

Left Turn Traffic Volume: $V_L = 15$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{460} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 3.3\%$$



Left-Turn Lane Warrant Analysis– Wellington 19 at 2 Line (Existing Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

AM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 135$

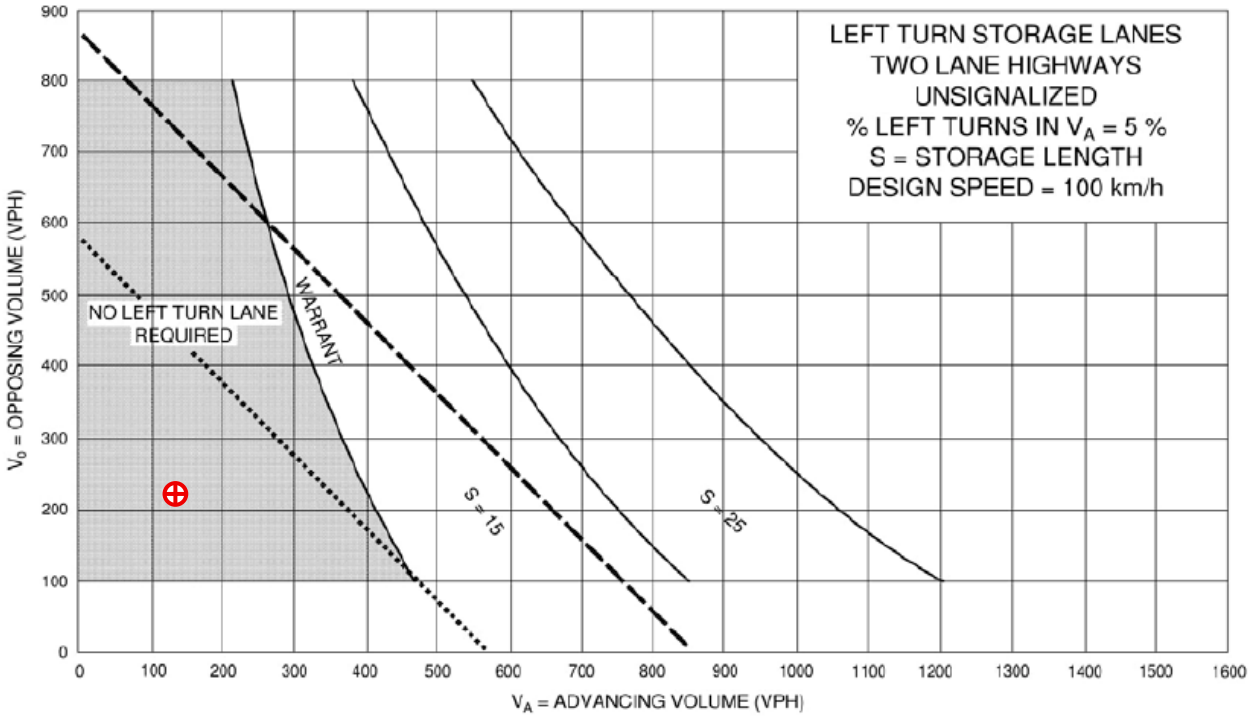
Opposing Traffic Volume: $V_O = 215$

Left Turn Traffic Volume: $V_L = 10$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{135} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 7.4\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 215$

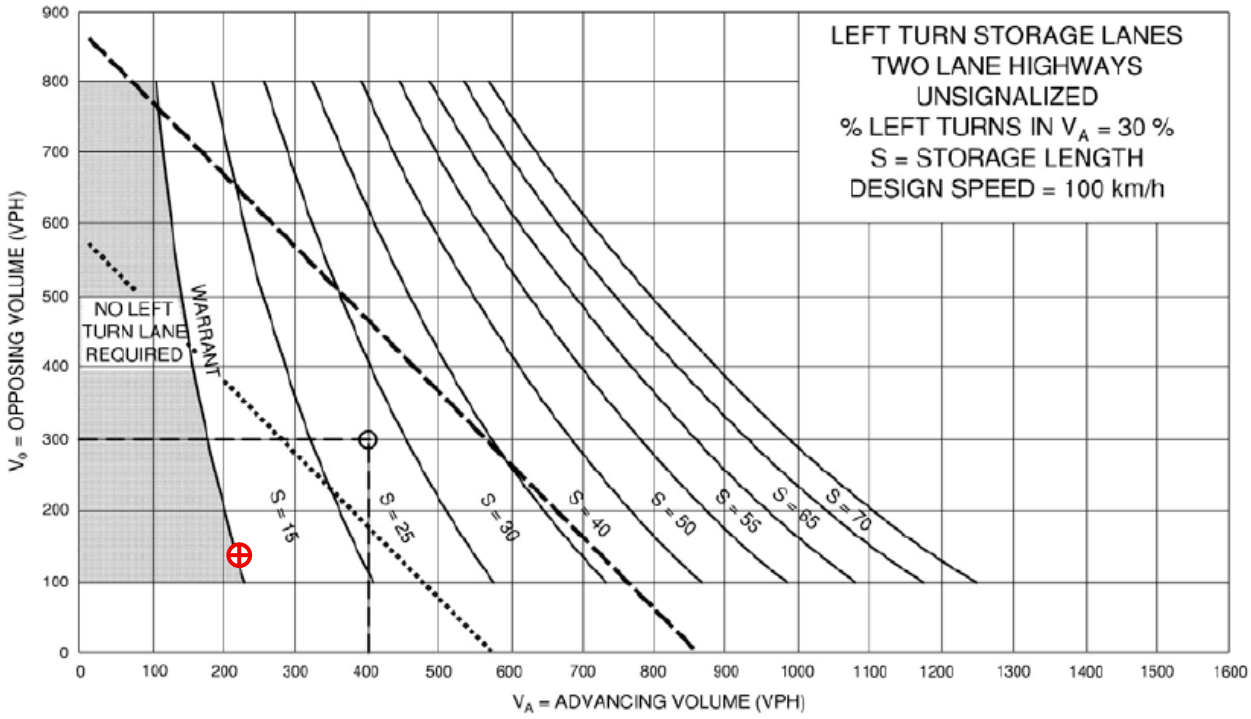
Opposing Traffic Volume: $V_O = 135$

Left Turn Traffic Volume: $V_L = 60$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{60}{215} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 27.9\%$$



PM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 240$

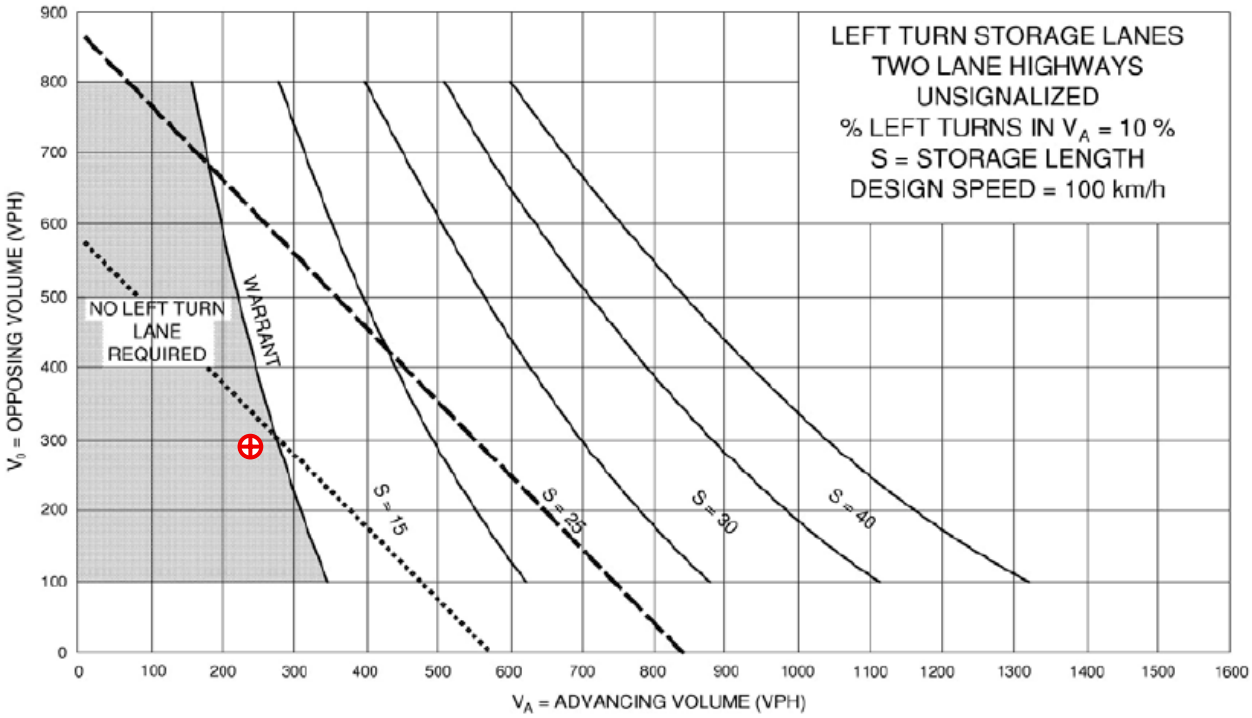
Opposing Traffic Volume: $V_O = 290$

Left Turn Traffic Volume: $V_L = 20$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{20}{240} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 8.3\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 290$

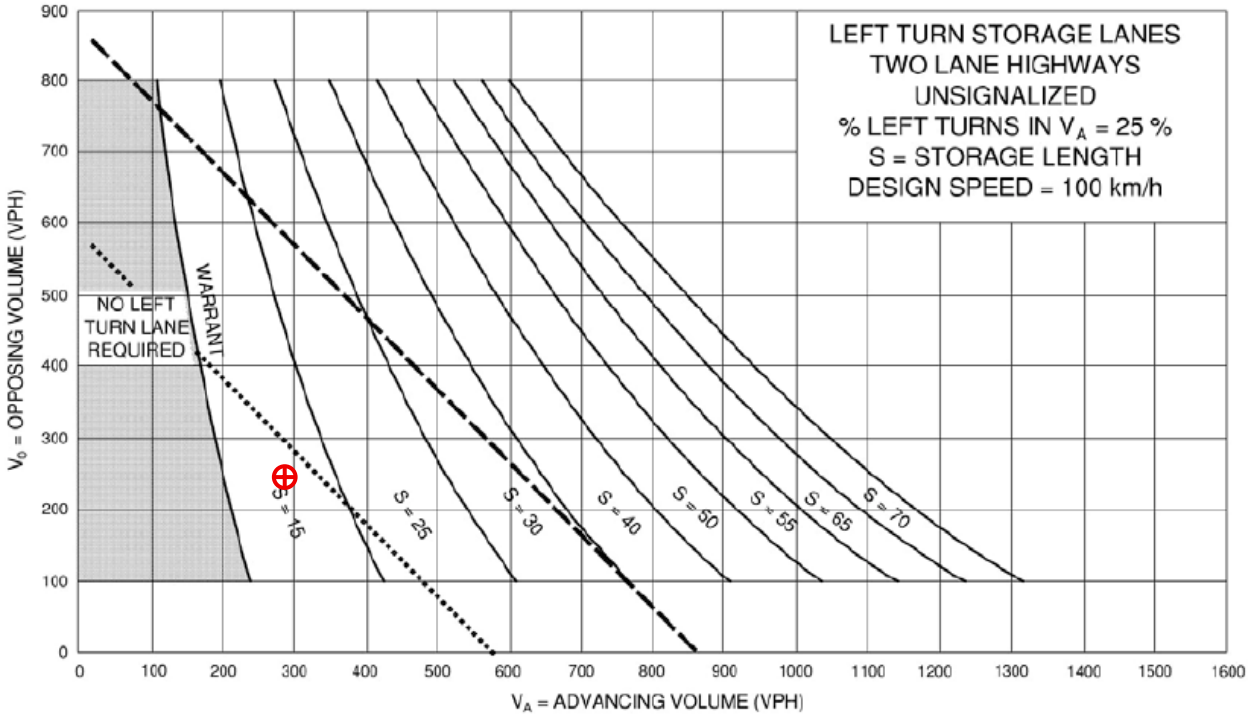
Opposing Traffic Volume: $V_O = 240$

Left Turn Traffic Volume: $V_L = 65$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{65}{290} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 22.4\%$$



SAT Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 285$

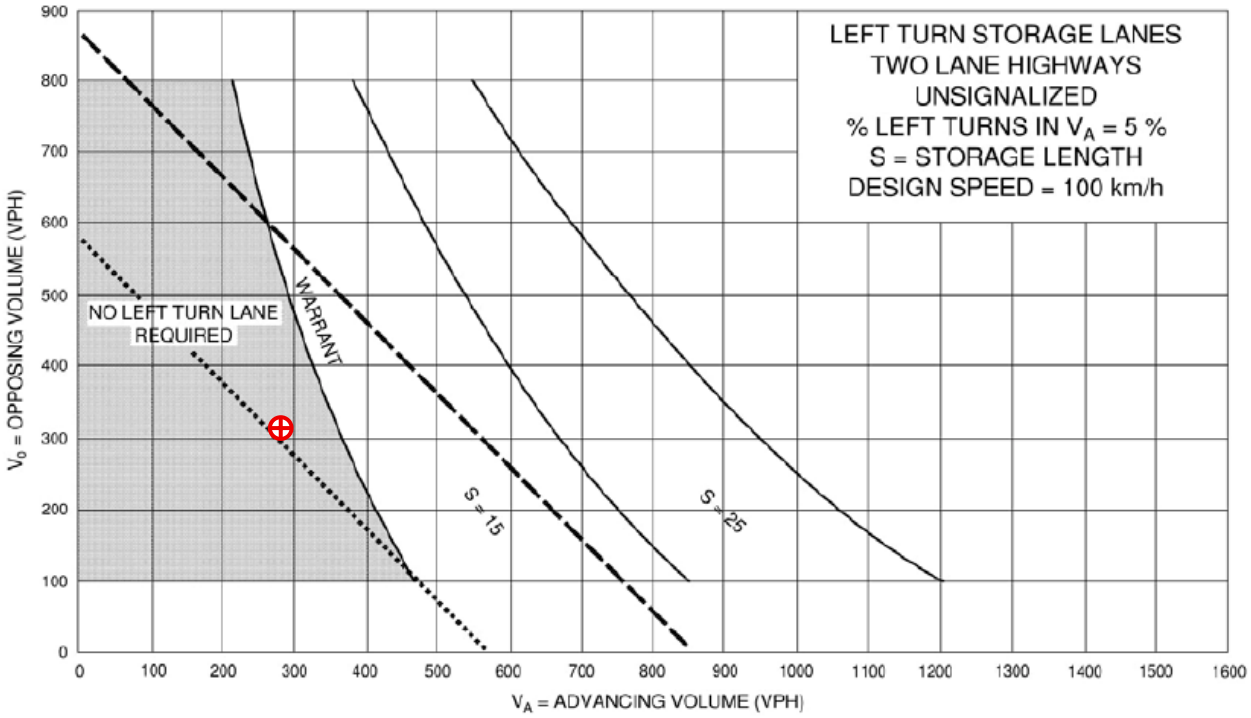
Opposing Traffic Volume: $V_O = 315$

Left Turn Traffic Volume: $V_L = 10$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{285} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 3.5\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 315$

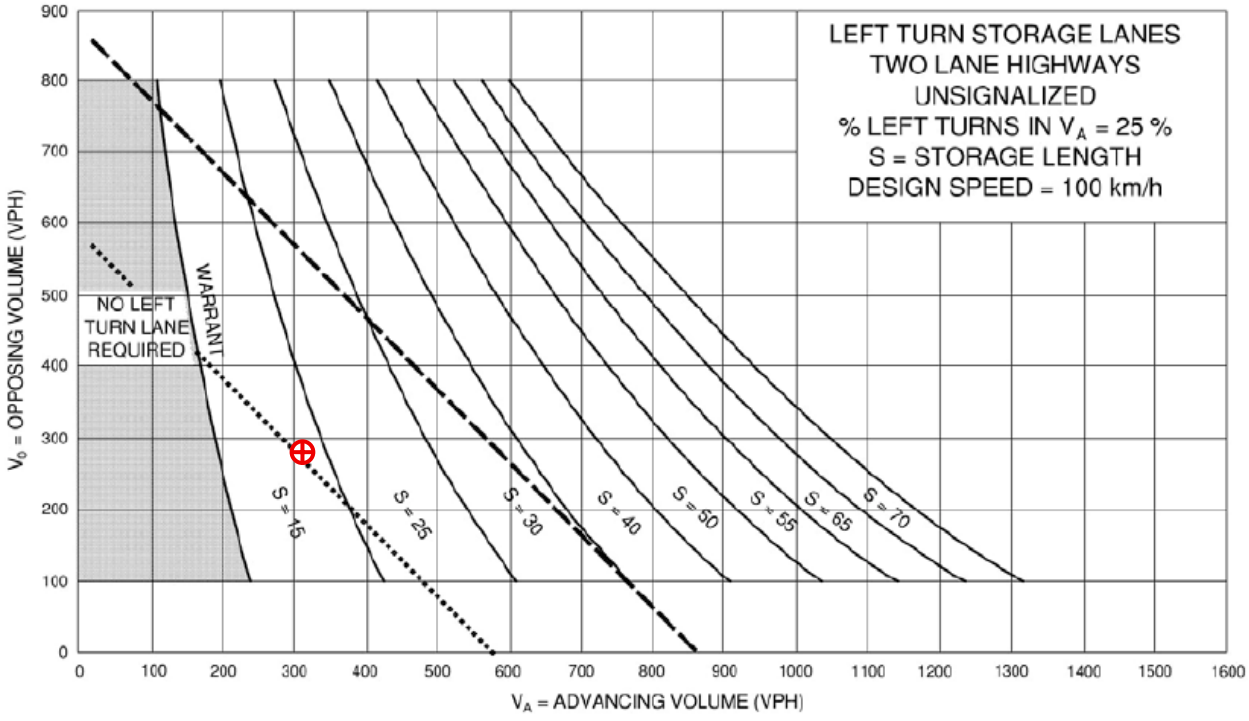
Opposing Traffic Volume: $V_O = 285$

Left Turn Traffic Volume: $V_L = 75$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{75}{315} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 23.5\%$$



Left-Turn Lane Warrant Analysis – Wellington 19 at 3 Line (Existing Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

AM Peak Period

Westbound Left

Existing Thru Traffic Volume: $V_A = 185$

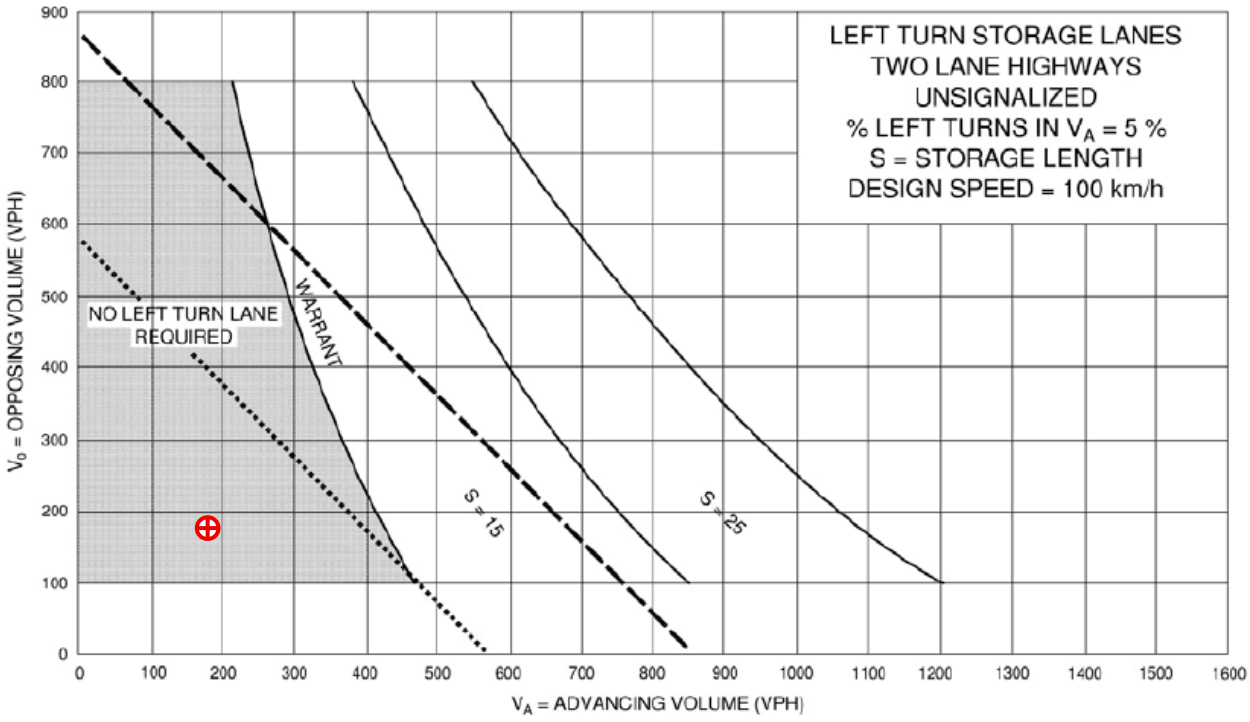
Opposing Traffic Volume: $V_O = 175$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{185} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.7\%$$



PM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 300$

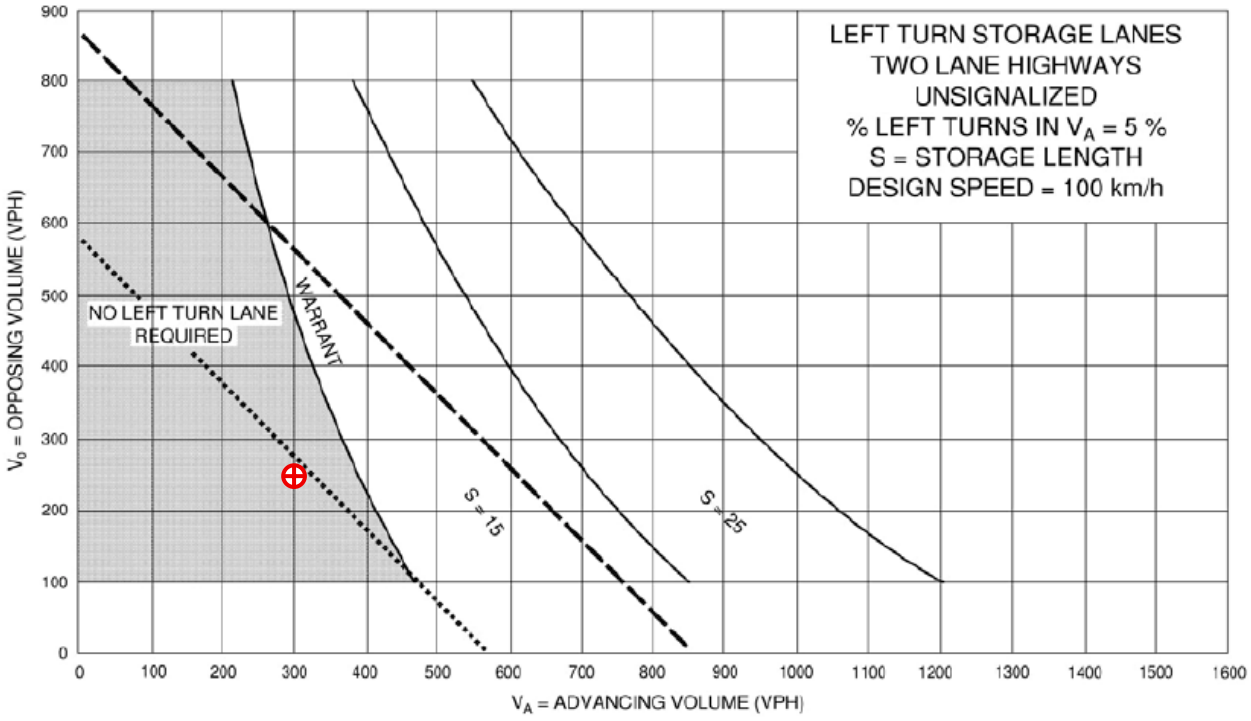
Opposing Traffic Volume: $V_O = 250$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{300} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.7\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 250$

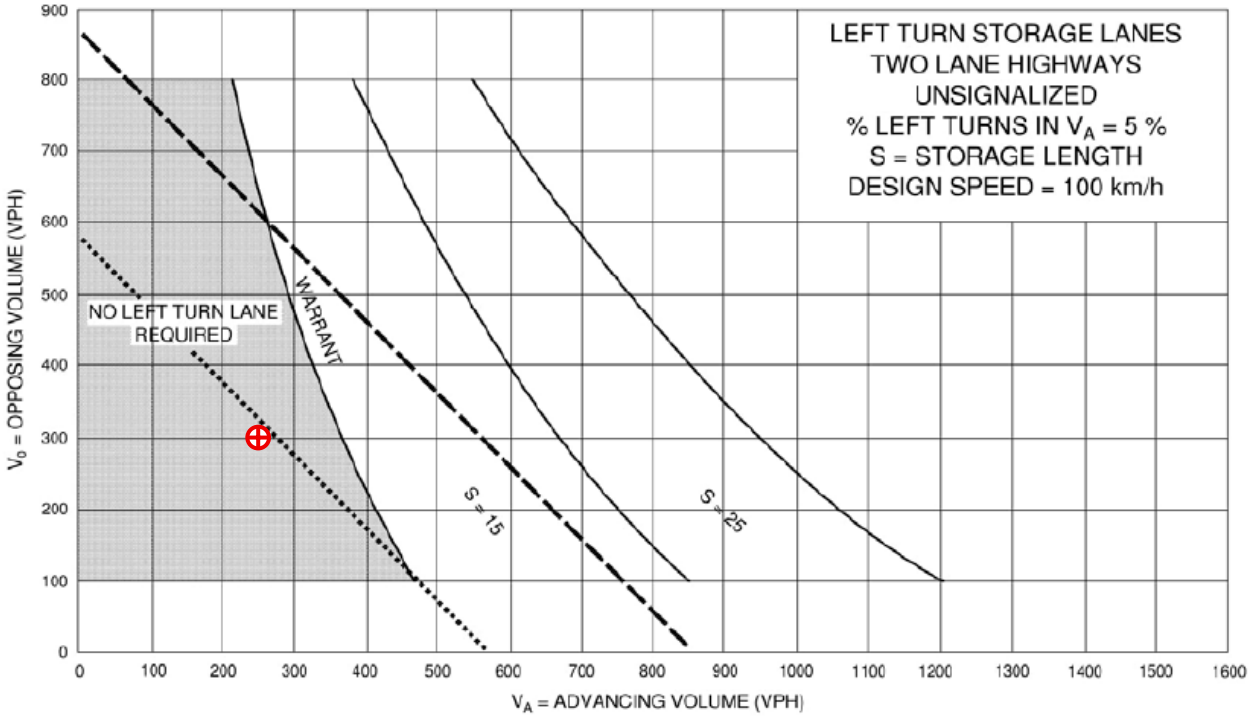
Opposing Traffic Volume: $V_O = 300$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{250} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.0\%$$



SAT Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 370$

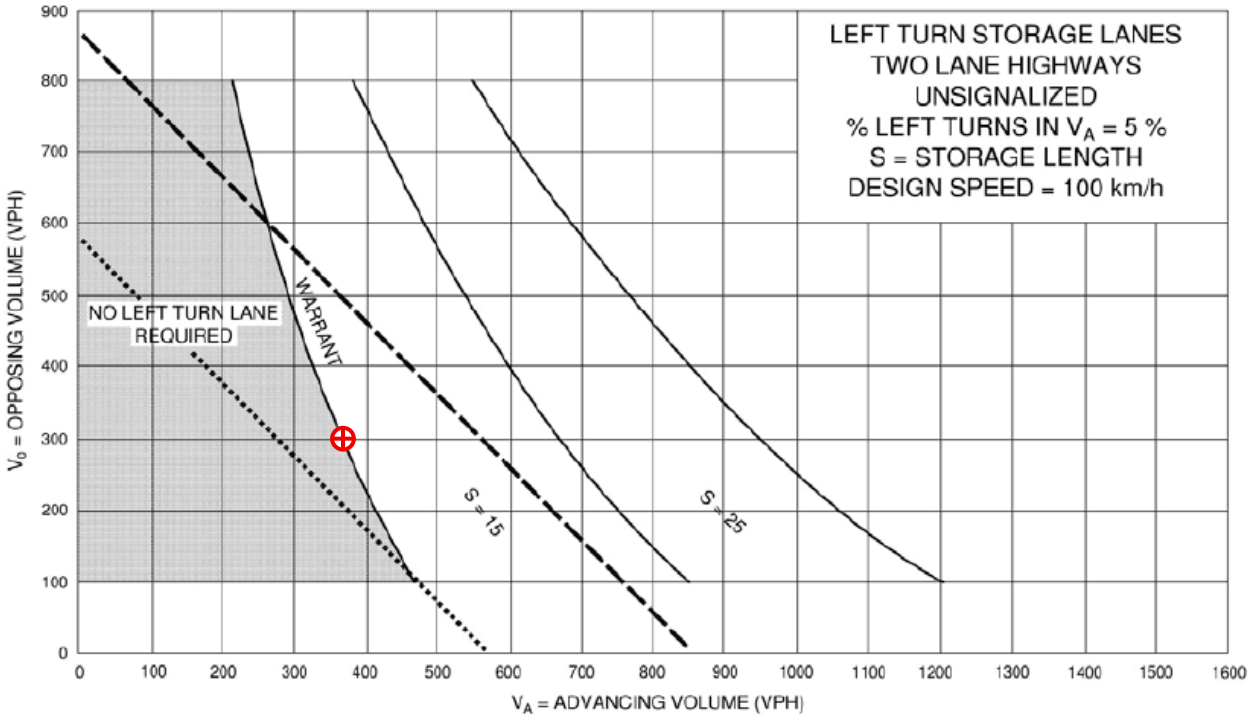
Opposing Traffic Volume: $V_O = 300$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{370} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.4\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 300$

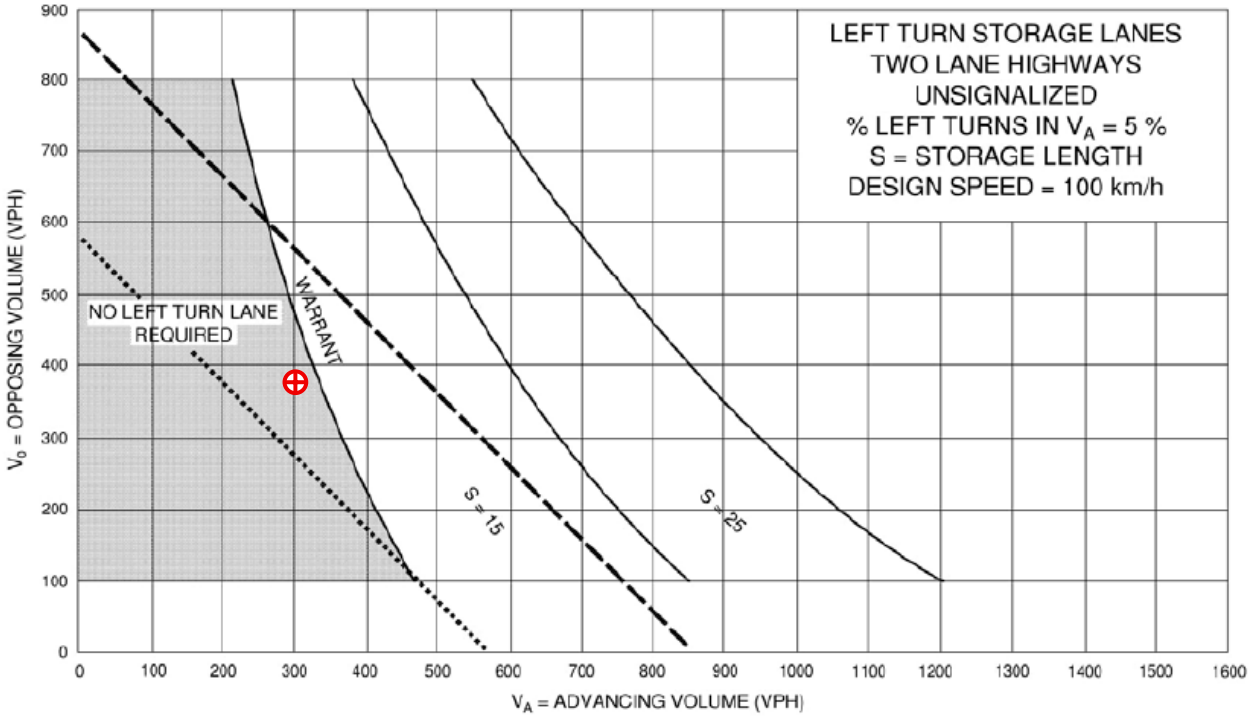
Opposing Traffic Volume: $V_O = 370$

Left Turn Traffic Volume: $V_L = 15$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{300} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 5.0\%$$



Left-Turn Lane Warrant Analysis – Wellington 19 at 3 Line (Future Background Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

AM Peak Period

Westbound Left

Existing Thru Traffic Volume: $V_A = 235$

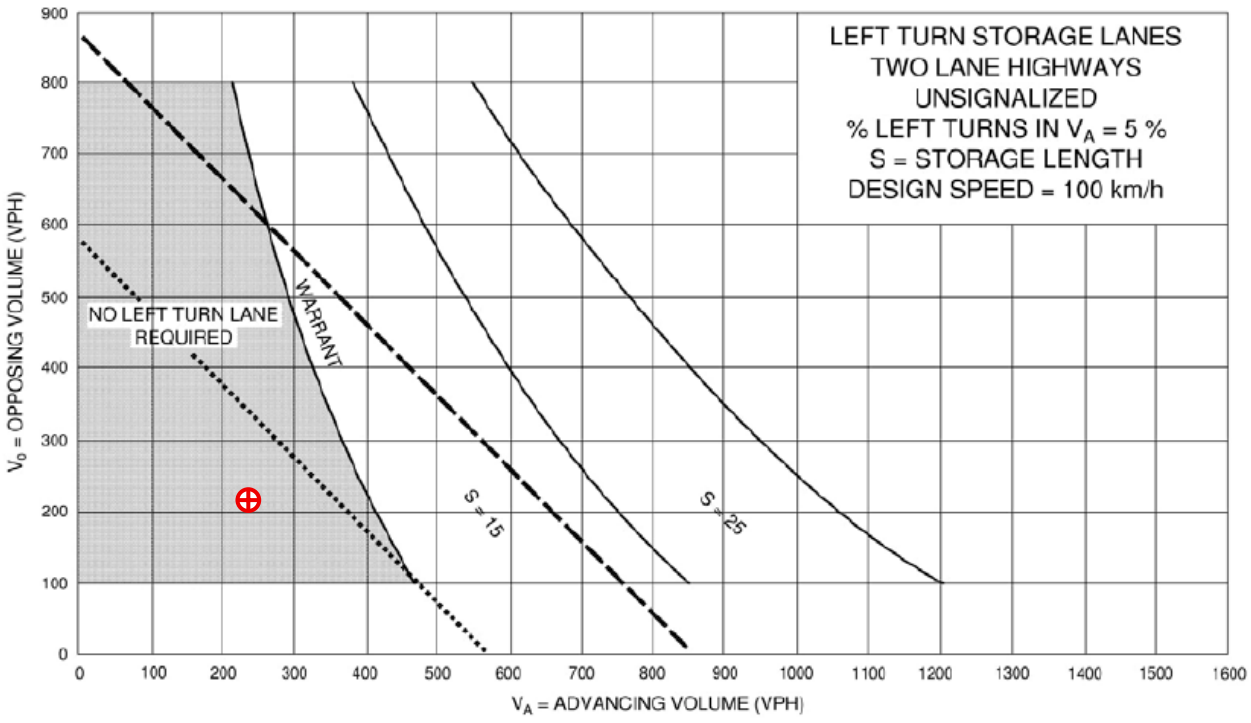
Opposing Traffic Volume: $V_O = 215$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{235} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.2\%$$



PM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 370$

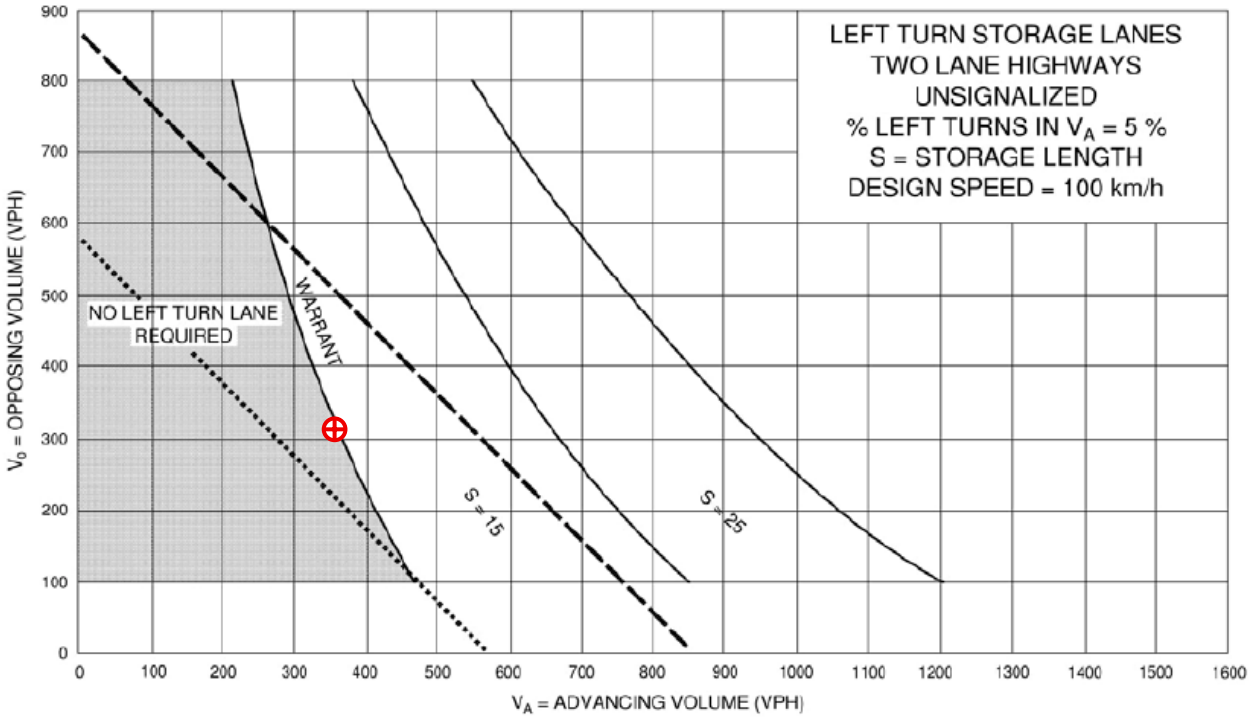
Opposing Traffic Volume: $V_O = 315$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{370} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.4\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 315$

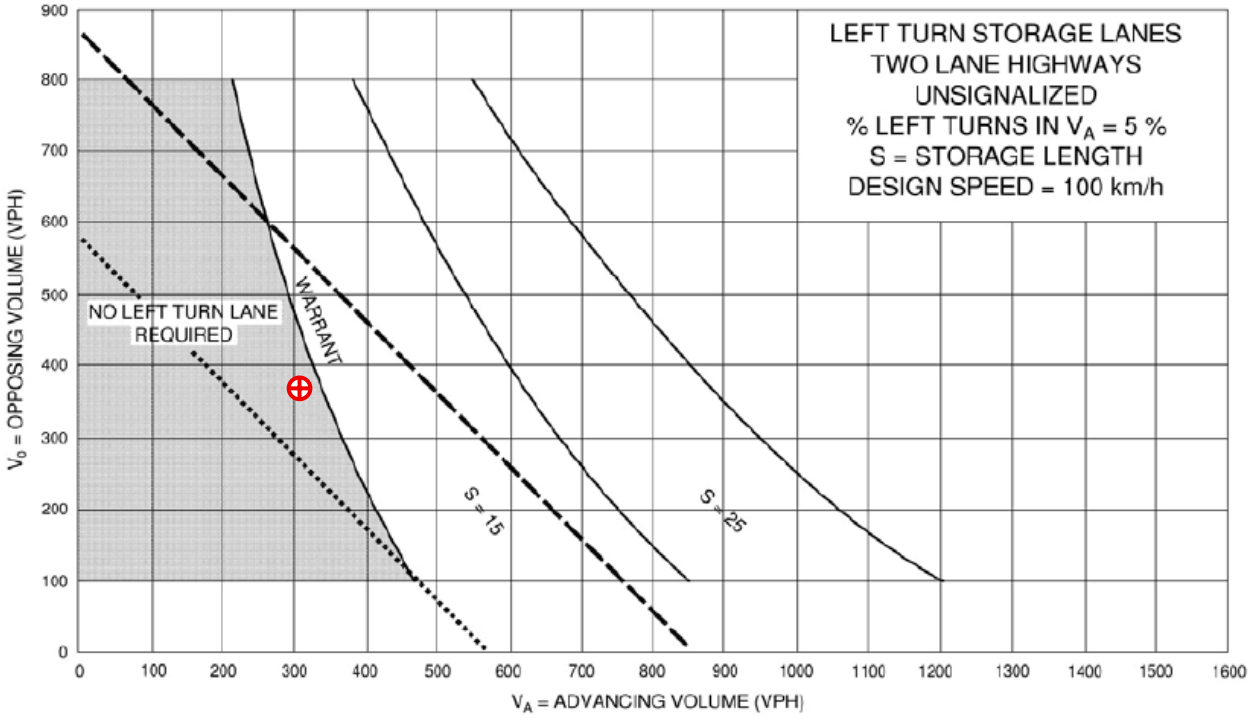
Opposing Traffic Volume: $V_O = 370$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{315} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.6\%$$



SAT Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 460$

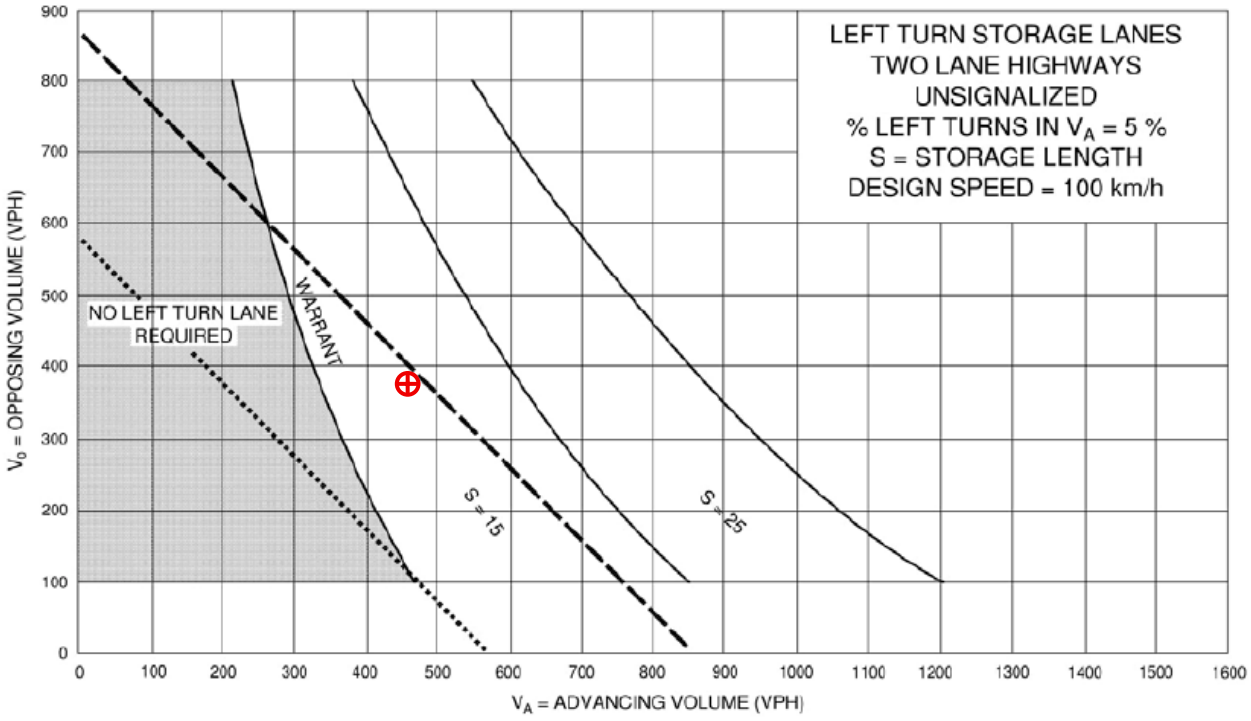
Opposing Traffic Volume: $V_O = 375$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{460} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.1\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 375$

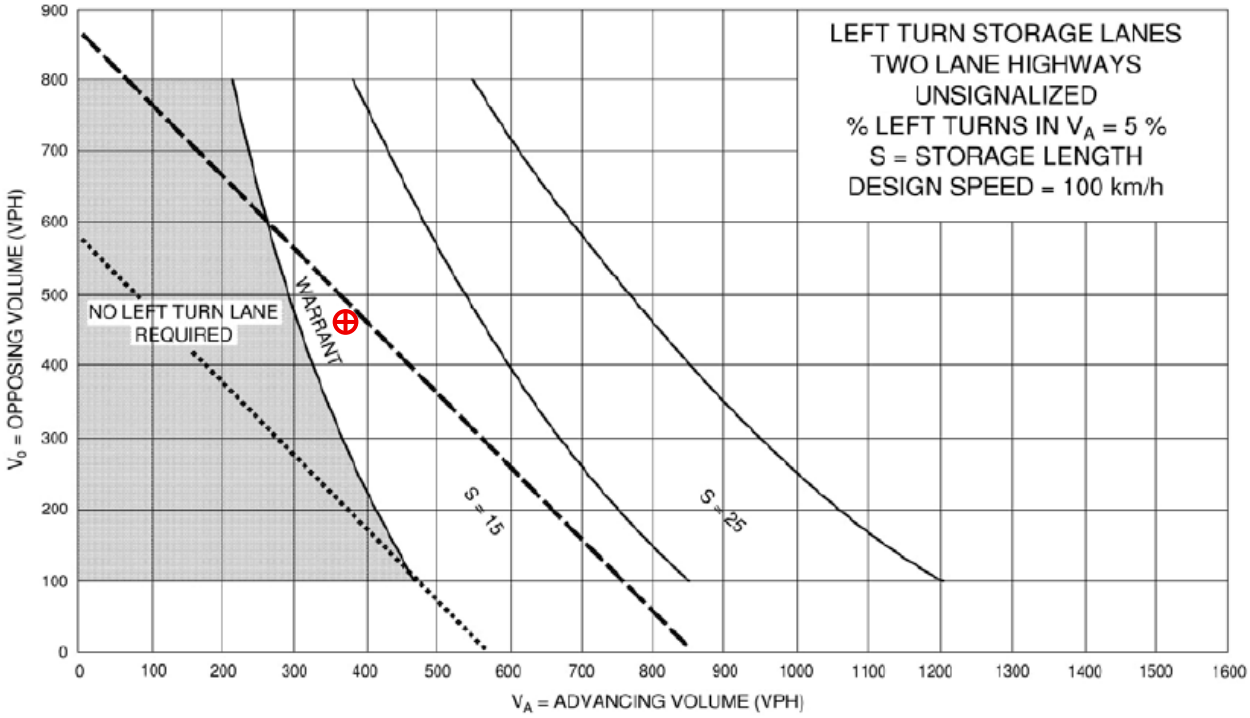
Opposing Traffic Volume: $V_O = 460$

Left Turn Traffic Volume: $V_L = 15$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{375} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.0\%$$



Left-Turn Lane Warrant Analysis – Wellington at 3 Line (Future Total Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

AM Peak Period

Westbound Left

Existing Thru Traffic Volume: $V_A = 285$

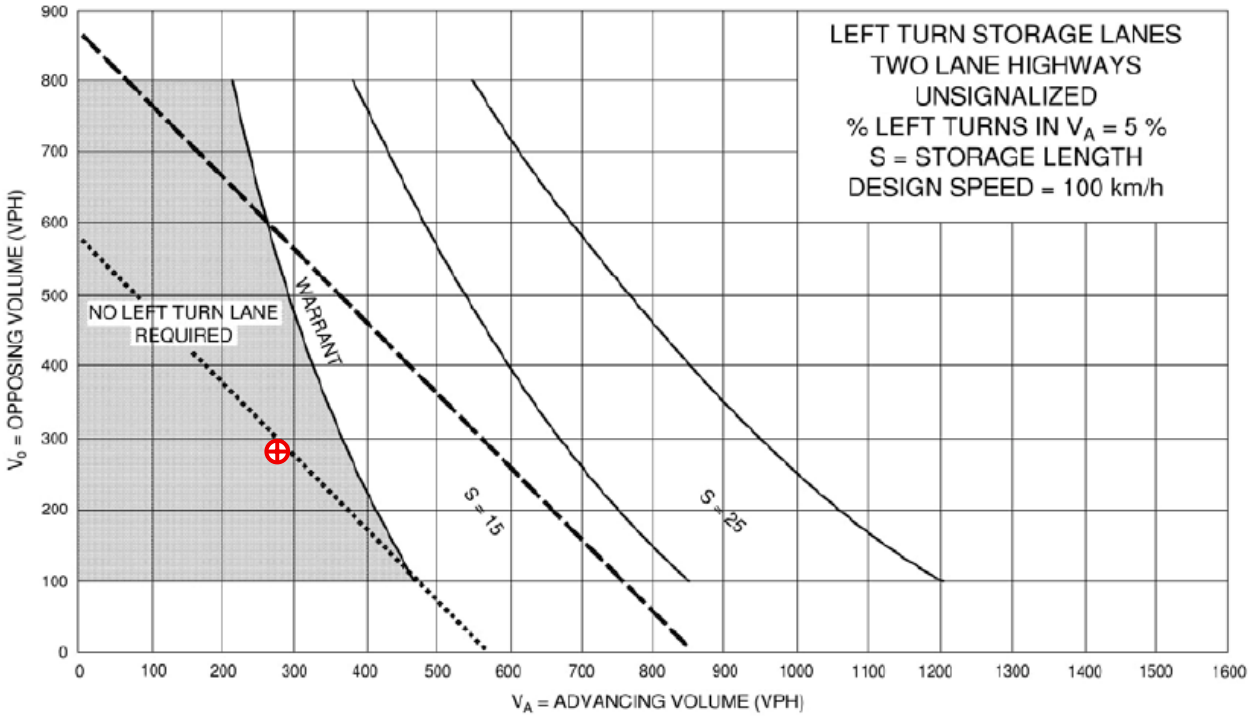
Opposing Traffic Volume: $V_O = 280$

Left Turn Traffic Volume: $V_L = 20$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{20}{285} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 7.02\%$$



PM Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 425$

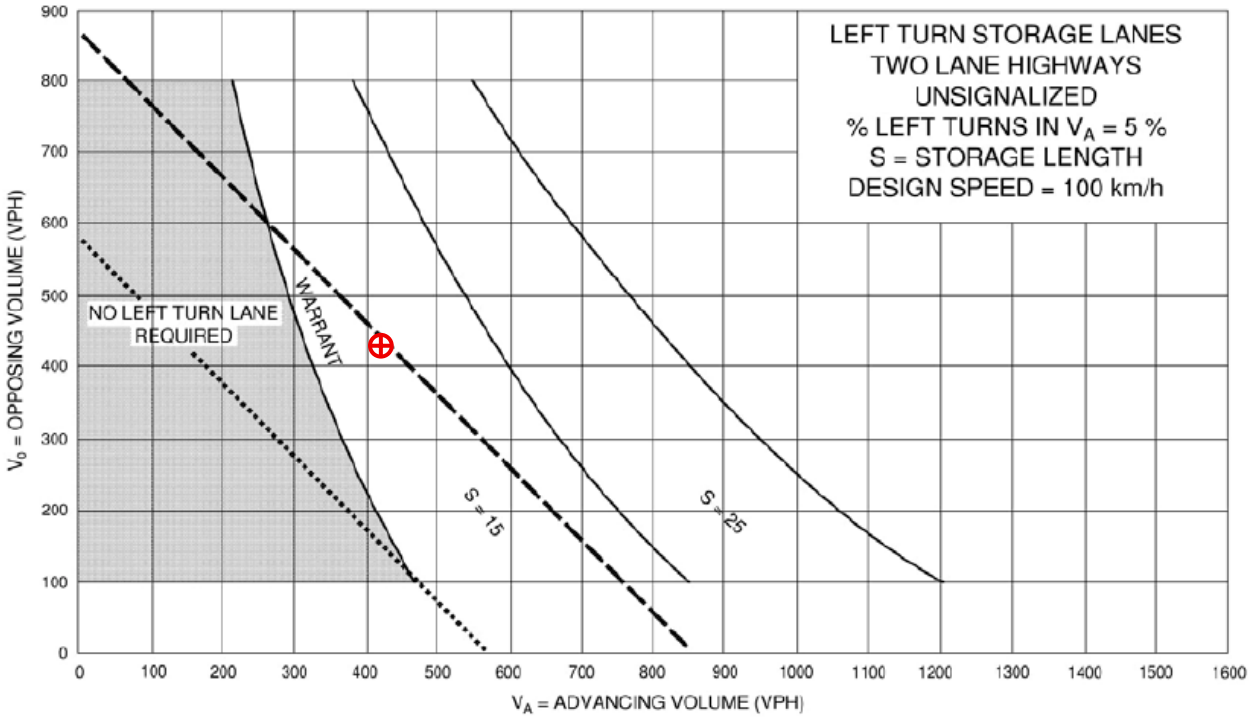
Opposing Traffic Volume: $V_O = 435$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{425} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.2\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 435$

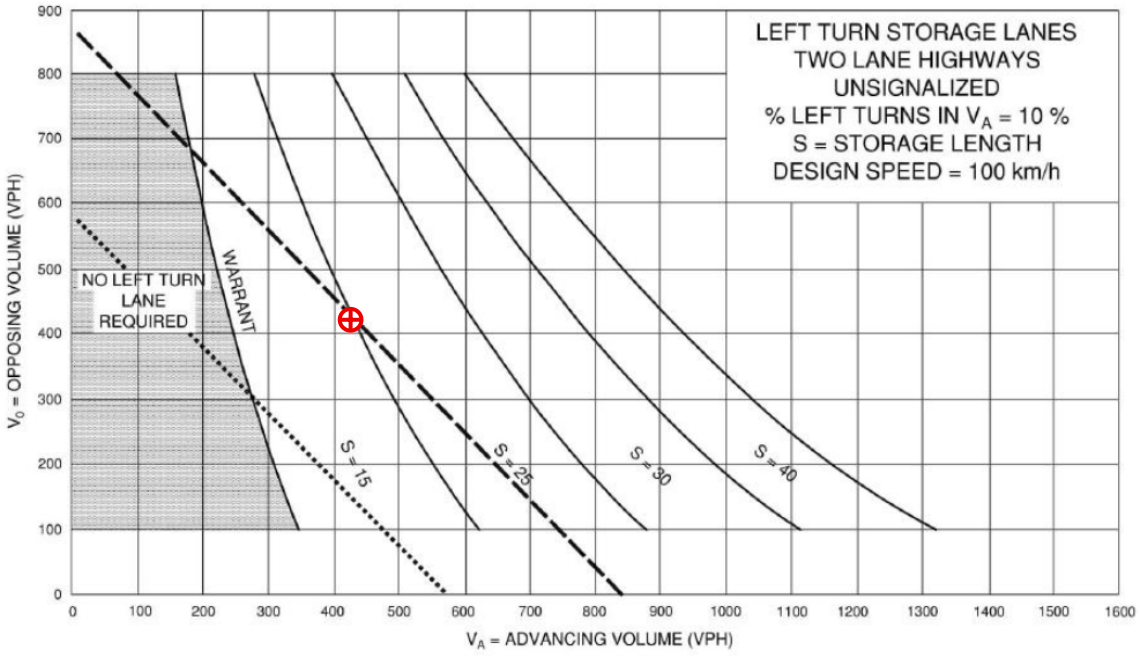
Opposing Traffic Volume: $V_O = 425$

Left Turn Traffic Volume: $V_L = 45$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{45}{435} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 10.3\%$$



SAT Peak Period

Eastbound Left

Existing Thru Traffic Volume: $V_A = 535$

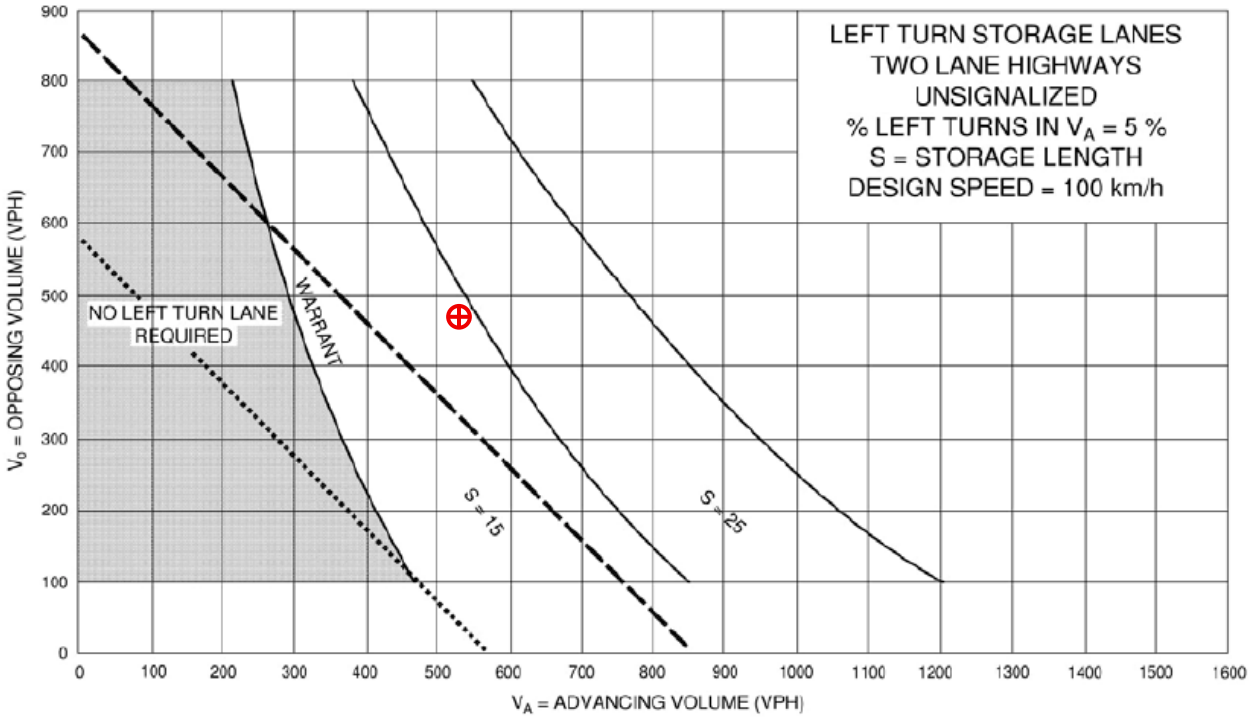
Opposing Traffic Volume: $V_O = 475$

Left Turn Traffic Volume: $V_L = 5$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{535} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 0.9\%$$



Westbound Left

Existing Thru Traffic Volume: $V_A = 475$

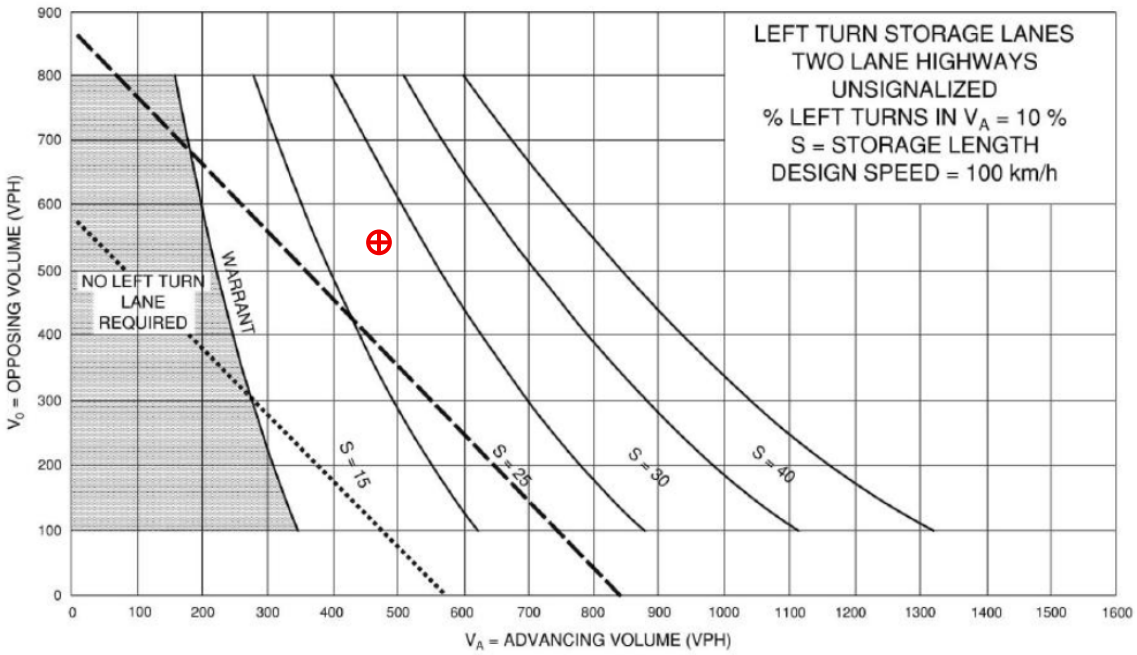
Opposing Traffic Volume: $V_O = 535$

Left Turn Traffic Volume: $V_L = 45$

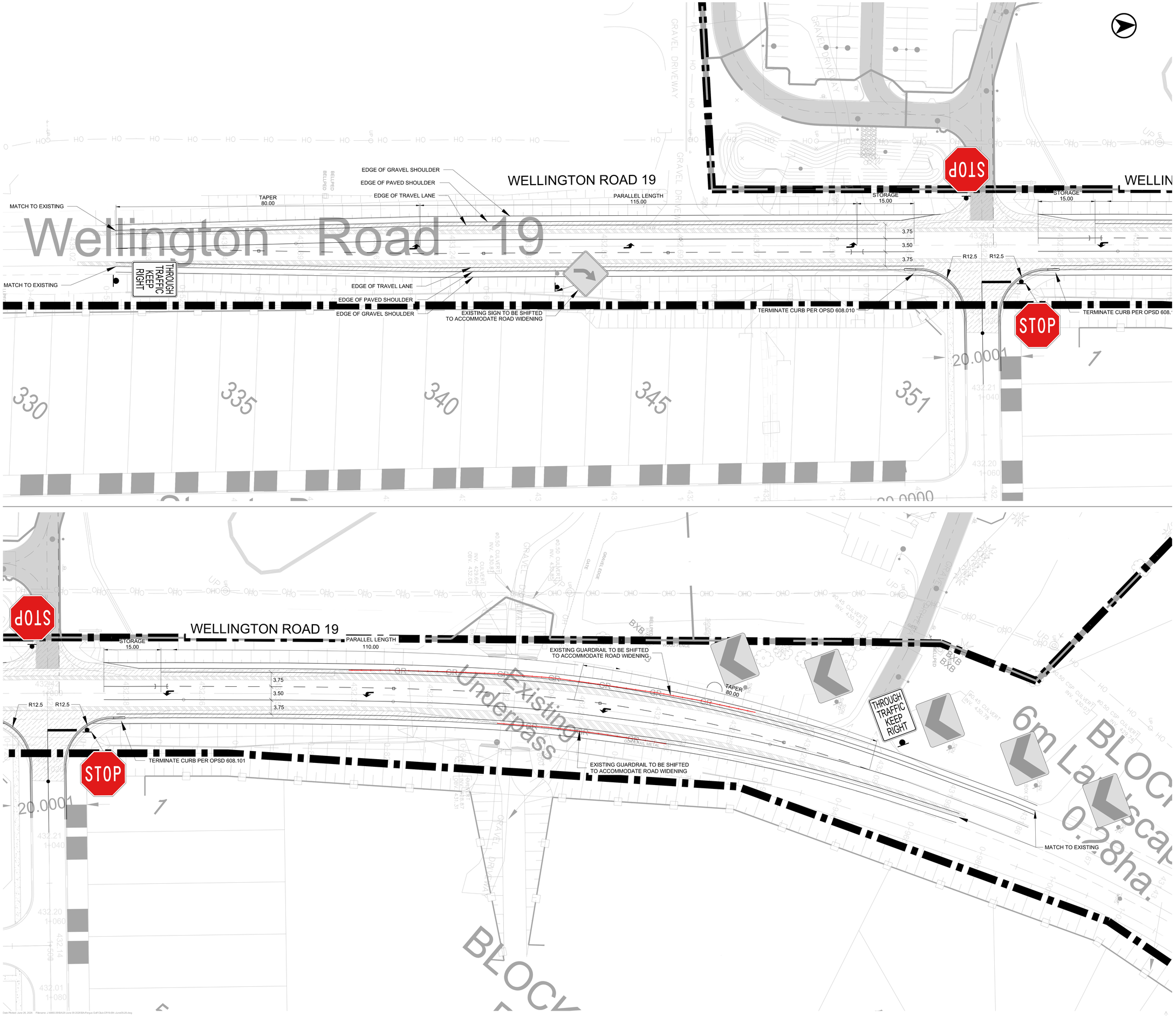
$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{45}{475} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 9.5\%$$



Appendix I
Functional Plan for Left-Turn Lanes on Wellington Road 19



SIGN LEGEND

(NOTE: ALL SIGNAGE MUST CONFORM TO THE ONTARIO TRAFFIC MANUAL

STOP — Ra-1 (600 x 600)mm

THROUGH TRAFFIC KEEP RIGHT — Rb-27 (600 x 750)mm

EXISTING SIGN LEGEND

Ex. Wa-3R (600 x 600)mm

Ex. Wa-9L (450 x 600)mm

PAVEMENT MARKING LEGEND

(NOTE: ALL MARKINGS MUST CONFORM TO THE ONTARIO TRAFFIC MANUAL BOOK 11)

- 10cm (4 inch.) WHITE SOLID
- 10cm (4 inch.) DOUBLE YELLOW SOLID
- 10cm (4 inch.) WHITE (3m LINE, 3m GAP)
- ALL STOP BARS TO BE 60cm (2 ft.) WHITE SOLID
- DENOTES LIMIT OF SYMBOLS
- LEFT TURN ARROW (3m (10 ft.))

SIGN MOUNT LEGEND

ALL SIGNS ARE SHOWN IN APPROXIMATE LOCATIONS AND TO BE DETERMINED ON SITE. SIGNS MUST BE VISIBLE TO DRIVER AND NOT OBSTRUCTED BY LANDSCAPE.

- PROPOSED SIGN POST
- EXISTING SIGN POST

02	06-26-26	MTR	ISSUED FOR SUBMISSION
01	11-12-25	MTR	ISSUED FOR SUBMISSION

BA Group

BA Consulting Group Ltd.
300 – 45 St. Clair Ave. W.,
Toronto ON M4V 1K9
ph. 416.961.7110
ewa. bagroup@bagroup.com

MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

FERGUS GOLF COURSE REDEVELOPMENT

SITE ACCESS LEFT TURN LANES FUNCTIONAL DESIGN

Date: JUNE 26, 2026

Project No.: 6860-39

Scale: 1:300 (0, 5, 10m)

FD-01

Date Plotted: June 26, 2026 Filename: J:\6860-39\BA\29 June 09 2026\BA-Fergus Golf Club-CR19-SN -June05-26.dwg

Appendix J
Pavement Marking & Signage Plan

SIGNAGE LEGEND:

NOTE: ALL SIGNS MUST CONFORM TO THE ONTARIO TRAFFIC MANUAL

Ra-1 (600 x 600)mm
Rb-62 (600 x 600)mm
Rb-51 (300 x 300)mm
Rb-1A (600 x 900)mm
Ra-1t (150 x 300)mm
Wa-1L (600 x 600)mm
Wc-7R (750 x 750)mm
Wc-7L (750 x 750)mm

SIGN MOUNT LEGEND

ALL SIGNS ARE SHOWN IN APPROXIMATE LOCATIONS AND TO BE DETERMINED ON SITE, SIGNS MUST BE VISIBLE TO DRIVER AND NOT OBSTRUCTED BY LANDSCAPE.

PROPOSED POST

PAVEMENT MARKING LEGEND:

NOTE: ALL MARKINGS MUST CONFORM TO THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 11

- 10cm (4 in.) WHITE SOLID
- 10cm (4 in.) YELLOW SOLID
- 10cm (4 in.) WHITE (3m (10 ft.) LINE, 3m (10 ft.) GAP)
- DENOTES LIMIT OF SYMBOLS
- LEFT TURN ARROW (3m (10 ft.))
- ALL STOP BARS TO BE 60cm (2 ft.) WHITE SOLID

02	06-26-26	KX	ISSED FOR SUBMISSION
01	11-12-25	MTR	ISSUED FOR SUBMISSION
00	11-29-24	MTR	ISSUED FOR SUBMISSION

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EMAIL bagroup@bagroup.com
MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

FERGUS GOLF COURSE REDEVELOPMENT

SIGNAGE AND PAVEMENT MARKING PLAN

Date: 2026-06-26

Project No.: 6860-39

Scale: 1:1,500 (0 25 50m)

SN-01

Date Plotted: June 19, 2026 Filename: \\bamediaaccount.file.core.windows.net\p2\out\6860-39\BA\29 June 09 2026\BA-Fergus Golf Club-SN-June05-26.dwg

Appendix K
On-Street Parking Plan

BLOCK 453
6m Landscape Strip
0.28ha.

Existing Underpass

BLOCK 447
Park
1.74ha.

BLOCK 450
Open Space
5.35ha.

Wetland

BLOCK 451
SWM
1.53ha.

BLK 448
Park
0.13ha.

BLOCK 449
Open Space
0.11ha.

BLOCK 452
Pump Station

BLOCK 454
SERVICING BLOCK

Wellington Road 19

Third Line

Street A

Street B

Street C

Street D

Street E

STREET A

STREET B

STREET C

STREET D

STREET E

WELLINGTON ROAD 19

3rd LINE

Date Plotted: June 17, 2026 Filename: J:\6860-39\BA\29 June 09 2026\BA-Fergus Golf Club-PP-June09-26_recover.dwg

GENERAL NOTES

1. THIS PLAN IS INTENDED FOR ILLUSTRATIVE PURPOSES ONLY, TO SHOW PARKING ALLOCATION. IT SHOULD NOT BE RELIED UPON FOR DETAILED DESIGN OR CONSTRUCTION

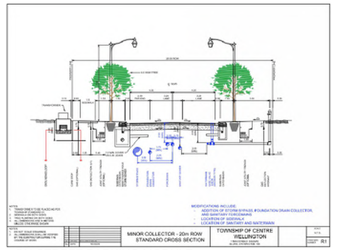
LEGEND

- DRIVEWAYS
- 6.7m PARALLEL PARKING SPACE
- 6.0m PARALLEL PARKING SPACE

ON-STREET PARKING SUPPLY

Units	Parking	Ratio (Parking/Unit)
446	179	0.40

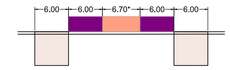
TYPICAL CROSS SECTION



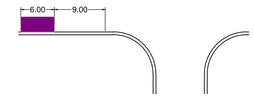
ON-STREET PARKING MODULE:

>2 Parking Spaces Between Driveways

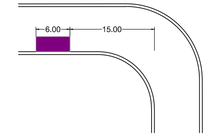
* Each additional parallel parking stall



Parking offset from intersection



Parking offset from inside of elbow



01	06-26-26	KX	ISSUED FOR SUBMISSION
00	MM-DD-YR	INT	REVISION NOTE

BA Group
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EMAIL bagroup@bagroup.com
MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

FERGUS GOLF COURSE REDEVELOPMENT

ON-STREET PARKING SUPPLY DIAGRAM

Date: 2026-06-26

Project No.: 6860-39

Scale: 1:1,500 (0 25 50m)

PP-01